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ABSTRACT

This preview of the Tests of General Educational Development (GED) to be introduced in 1988 begins with a brief background of the review process that will result in the GED Test. An overview of committee recommendations then highlights five themes of Test Specifications Committee panel reports: the tests should (1) demand more highly developed levels of critical thinking and problem solving, (2) include a clear emphasis on the relationship of the skills to the aspects of the world of work, (3) represent awareness of the role and impact of computer technology, (4) address certain consumer skills, and (5) use settings that adult examinees could recognize. Descriptions of the five tests in the GED Tests battery follow: Writing Skills, Parts I and II; Social Studies; Science; Interpreting Literature and the Arts; and Mathematics. Each test is described in terms of some or all of the following: content, context, format, item types, and cognitive levels. Sample test items and answer keys are provided. More detailed information is included for Part II of the Writing Skills Test. For this section, a sample topic is presented and sample essays are provided. The GED Essay Scoring Guide, commentary on the sample essays, and a discussion of how the GED essay is scored follow. (YLB)

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The 1988 Tests of General Educational Development: **A Preview**

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The 1988 Tests of General Educational Development: **A Preview**

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The 1988 Tests of General Educational Development: A Preview

Table of Contents

The Background 5

Overview of the Committee Recommendations 6

Writing Skills 8
- Part I 8
  - Sample Paragraph 9
  - Sample Test Items 10
  - Answer Key 12
- Part II 15
  - Sample GED Essay Test 16
    - Sample Topic 16
    - Sample Essays 17
  - GED Essay Scoring Guide 35
  - Commentary on Sample Essays 36
  - How the GED Essay is Scored 38

Social Studies 41
- Sample Social Studies Items 43
- Answer Key 46

Science 49
- Sample Science Items 50
- Answer Key 52

Interpreting Literature and the Arts 53
- Sample Excerpts and Items 55
- Answer Key 58

Mathematics 61
- Formulas 63
- Sample Mathematics Items 64
- Answer Key 66

Further Reading 69

The Background

The GED Tests to be introduced in 1988 are the result of a five-year review process that began with a series of surveys to gather the views of adult educators around the country. The first survey asked for a consideration of the GED Testing program goals, the second asked what the GED Tests should measure, and the third posed questions regarding test format.

With the responses to the surveys in hand, the GED Testing Service staff asked State Directors of Adult Education and GED Administrators in the United States and Canada to nominate curriculum and adult education experts to serve on a test specifications committee. Nominations were also obtained from the various national associations of secondary education teachers. From the pool of several hundred nominees, a select group of 26 was invited in February, 1984. The committee met for three days in Washington and, guided by the survey results and the spate of national reports on the condition of American education, drafted a set of recommendations for the content of the next generation of the GED Tests (GEDTS, 1984).

The GEDTS staff then prepared a working plan for implementing the recommendations. This detailed proposal was presented for discussion to the GED state and provincial administrators at the GED annual meeting in July of 1984 and to the GED Advisory Committee in August of 1984. At the conclusion of this extensive review, the staff working document was further revised and presented in September of 1984 to the Commission on Educational Credit and Credentials, the policy-making body of the GED Testing Service. The Commission approved nearly all of the staff recommendations, but directed that research be conducted into the feasibility of implementing two recommendations: adding a writing component to the Writing Skills Test and permitting examinees to use calculators during the examination.

After the Commission's initial approval, the GED Testing Service staff and item writers developed several hundred items according to the newly-approved specifications. These items are being field-tested each spring and fall in item tryout administrations in GED testing centers in a number of states and Canadian provinces.

At the same time that the staff was developing multiple choice items for use in field test administrations, they were also conducting studies of the feasiblity of essay scoring methods. The staff presented their findings from these studies (see GED Research Studies 6 and 7) to the GED Administrators and to the National GED Advisory Committee during July and August of 1985. Acting upon the unanimous recommendation of the Advisory Committee, the Commission approved the inclusion of an essay as Part II of the GED Writing Skills Test at its September, 1985 meeting.

The most recent action by the Commission leaves only one aspect of the 1988 tests yet to be determined: whether or not examinees will be permitted to use calculators on the GED Mathematics test. The staff expects to complete the research and make a final recommendation on this issue to the Commission at its March, 1986 meeting.

Overview of the Committee Recommendations

Critical Thinking and Problem Solving

Many of the recommendations of the Test Specificatons Committee refer to the entire battery and were reiterated by each of the four subject matter panels. The main recommendation in the panel reports was that the **new tests should demand more of the examinees in the way of high level thinking and problem-solving skills.** While reaffirming that the GED Tests should continue to concentrate on the skills expected as outcomes of a four-year program of high school study (as did the survey responses in phase one), the committee stressed that these should be viewed as a set of **comprehensive, integrated skills** rather than isolated fragments of learning from individual disciplines. Viewed in this way, the major and lasting outcomes associated with the completion of a high school program of study are those reasoning skills that enable a person to understand, explain, and evaluate new experiences.

This recommendation parallels the concerns now paramount in the National Assessment of Educational Progress (LaPointe, 1984). NAEP judges that, with respect to high school students, the basic comprehension skills, math basic operations, and writing mechanics are being addressed through recently introduced assessment and instructional programs. Of concern, however, are the notable declines of achievement levels in inference and problem solving and analytical abilities. High school students are often unable to support a position with clear and relevant arguments, to infer significance beyond the articulated points in a passage, or to engage in the more complex thought processes of analysis and evaluation. In different words, the test panels showed similar concerns and suggested new ideas for the GED assessment that would expand the depth of the current tests to measure some of these skills. The revised GED Tests will clearly tap more strongly the higher level analytical skills of the examinees.

Relations to the World of Work

A second major theme of the panel recommendations, stressed more strongly in the written reports of some than in others, was that **the new tests should include a clear emphasis on the relationship of the skills to aspects of the world of work.** This will be done in two ways: (1) each of the tests will contain items that portray the educational skills as they might be used in a work setting (e.g., a written passage in the Social Studies test might concern an employee faced with a decision about joining a union); (2) each of the tests will include written passages that involve a working person involved in some task (e.g., a math item might involve an employee trying to describe in words the information contained in a graph). In these ways, the tests will reflect the connection between educational skills and work tasks. Although not specifically referenced as such, many of the objectives to be measured in the tests are represented in the recent "Basic Skills and Competencies for Productive Employment" (Task Force on Education for Economic Growth, 1983). In general, this emphasis reflects the panels' recommendations that career awareness and work-related use of educational skills be emphasized. Not all items and passages will be so oriented, but many will be.

Awareness of Computer Technology

A third theme of the panel reports was that **awareness of the role and impact of computer technology should be represented in the tests.** It is **the way in which computers have affected the lives of the examinees,** rather than the specific skills needed to operate and program computers, that is intended here. The panels favored this approach to the role of computers—suggesting that test passages and questions could be developed relating to the impact of computers in the office workplace, their use in supermarket checkout lines, their use in maintaining and retrieving records, their use in analyzing massive amounts of data, and so on. The panels rejected the notion of testing knowledge of programming languages, hardware operations, or specific programs. That is, we will not test computer proficiency or computer literacy. (Phase two survey respondents gave mixed reactions to the question of whether or not computer literacy should be tested, noting the limited opportunities for adults to work with computers in their educational or personal experiences). Rather, we will use content that relates to computer awareness in many of the tests (see, for example, the sample passage in Test One) and will include the context of organizing the steps necessary to write a simple computer program in Test Five. (The panels felt strongly, however, that no programming languages should be used. The items will address only the logical *ordering* of the steps to be taken.)

Consumer Skills

A fourth theme in the panel reports was that **certain consumer skills should be addressed in the context of many of the tests.** For example, it would be possible to include in the Science tests passages and questions that require the examinee to apply the methods of science in a consumer context (e.g., conducting a simple experiment to determine which laundry detergent produces the brightest wash) and to apply the concepts of science in explaining or interpreting an everyday consumer experience (e.g., explaining why the car radio fades in and out when driving through the area of the city where tall buildings are common). Similarly, in Test Five, some items will address problems encountered in comparative shopping (ratio and proportion) and installment purchases (percentages and simple interest). Some of the passages in Test One will describe situations of concern

to the consumer and will convey useful and accurate information, even though they serve primarily as a means to test English conventions skills. In this respect, while the tests will not contain items requiring the examinee to reproduce *information* needed by consumers (e.g., that manufacturers' warranties must be available for purchased products), the tests will contain examples of the ways in which one can become a better consumer by applying educational skills and knowledge.

Adult Settings

A fifth theme common to the panel reports is that **the tests should use settings that adult examinees would recognize.** The panels stressed the need, in all five tests, to present stimulus material that relates to aspects of daily living. Specifically, it was the committee's intent that written material and items used throughout the test battery concern situations recognizable to many examinees. While this has been done with the current tests to some extent, the new tests will involve a greater number of situations recognizable to large segments of the examinee population. Specifically, passages and items on topics including consumer activities, daily living choices, news, sports, entertainment, and the like will form the basis for significant segments of all of the tests. In this way, concerns about the relevance of the skills tested for the examinees' daily lives will be adequately addressed. While it will not be possible to clearly relate every item to *each* examinee's experiences, nor to relate each item to daily living experiences, the new tests will measure skills in contexts common to the experiences of many examinees.

Summary

In summary, the design for the GED Tests to be introduced in 1988 is the product of the combined efforts of people throughout the adult and secondary education community. The efforts of the GED Testing Service staff have been guided by the many diverse views of this constituency and by national reports characterizing secondary education in America. The GED Tests that result from these efforts will:

- demand more highly developed levels of critical thinking and problem solving;
- reflect the many roles of individuals (e.g., worker, family member, consumer, and citizen of the country and of the world);
- acknowledge the sources of change affecting individuals and society (e.g., rapid introduction of computers, pervasive impact of television, shifting political priorites, and new opportunities afforded by scientific advances);
- contain settings that adult examinees will recognize as relevant to daily life.

The test descriptions which follow illustrate how these principles are implemented within each of the five tests in the GED Tests battery.

Writing Skills, Part I

The Writing Skills test of the revised GED Tests is comprised of two parts, one part to test knowledge of the conventions of written English, and the second to test directly the ability to write. The scores earned on both components of the test will be combined and reported on a standard score scale as a single score. The recommendation that the test include a writing sample is a dramatic revision to the current test content. However, the Language Arts panel (and, indeed, the entire test specifications committee) expressed its view on this matter in no uncertain terms: "The English specifications panel believes that no one should receive credit for high school equivalency without being asked to demonstrate writing ability directly as well as indirectly."

Content

Part I of the Writing Skills test will resemble the current GED Writing Skills test in several ways. First, both the current test and a part of the revised test use a multiple choice format which presents items that require error recognition and correction. The revised test will include items in approximately the following proportions:

Sentence Structure: 35%
Usage: 35%
Mechanics (spelling, punctuation, and capitalization): 30%

In the current Writing Skills test, 30% of the items are Sentence Structure/Diction and Style, 30% are Usage, and 25% are Mechanics. The remaining 15% in the current test consists of items in Logic and Organization, which will be measured directly in the essay component of the revised Test One.

Context

The subject matter for the Writing Skills test, Part I includes those topics with which the examinee is likely to be familiar. Relevant subjects may include topics of practical interest such as consumer affairs, career skills, and computer awareness or subjects of more general interest such as vacations, health, family life, and education.

Format

As adults usually need to write and proofread connected pieces of discourse, Part I directly measures proofreading skills in the more realistic setting of paragraphs. These paragraphs are 10-12 sentences long and, when corrected, are examples of good writing.

Some of the sentences within each paragraph contain errors which students must locate and correct. In some cases the sentences do not contain errors but require revision for the sake of clarity or logic. The errors to be corrected are those most often encountered in student writing, most complained about by the public, and most likely to hamper a person's advancement, acceptance, or ability to communicate effectively to various audiences. The sentence to be corrected is repeated in each item and the alternatives (or answers) are presented in the order in which they occur in the sentence.

In at least half of the items (or questions), the alternatives do not appear by categories . That is, alternatives for each item may often be from any of the five content areas—again in an attempt to create a realistic proofreading situation. (This range of alternatives is found in the *sentence correction* item type described below.)

Item Types

The items in the Writing Skills test, Part I are classified by item type. "Item type" refers to the *method* by which the content areas are tested and by which the examinee is asked to respond. The three item types are used in the following proportions:

(1) Sentence Correction: 50%
(2) Sentence Revision: 35%
(3) Construction Shift: 15%

Examples of each type are provided below.

Item Type 1: Sentence Correction

This item type is used to test skills in all content areas of the Writing Skills Test, Part I. The sentence correction item type repeats one of the sentences from the paragraph and asks what correction should be made. Several examples are given of this type with different content areas and categories.

Item Type 2: Sentence Revision

This item type is used to test skills in the content areas of Sentence Structure, Usage, and Punctuation. The sentence revision format consists of a stem with a part underlined that may or may not contain an error in sentence structure. The alternatives which follow list various possible corrections to the underlined section of the stem. In this item type, the first alternative is always exactly the same as the original sentence.

Item Type 3: Construction Shift

This item type is used to test skills in the content areas of Sentence Structure and Punctuation. The construction shift type consists of a stem which must be rewritten using a different structure. The sentence which results from the revision must have the same meaning as the original sentence and must be correct and clearly stated. While the stems in sentence correction and sentence revision item

types usually contain errors, construction shift stems do not. These items aim at testing an examinee's ability to employ alternate structures correctly rather than the ability to correct errors. Implicitly, logic skills are also tested here, as well as an understanding of sequence of events.

Cognitive Levels

All items tested in the Writing Skills test, Part I are at the *application* level and classified by item types, as described above.

The following is a sample paragraph appropriate for Part I of the Writing Skills test by virtue of its subject, length, and reading level. Following the paragraph are sample items illustrating a variety of item types, content areas and categories.

SAMPLE PARAGRAPH

Directions: The following items are based on a paragraph which contains numbered sentences. Some of the sentences may contain errors in sentence structure, usage, or mechanics. **A few sentences, however, may be correct as written.** Read the paragraph and then answer the items based on it. For each item, choose the answer that would result in the most effective writing of the sentence or sentences. The best answer must be consistent with the meaning and tone of the rest of the paragraph.

(1)Computer programs are sets of specialized instructions. (2)Programs, stored on magnetic disks, are also known as software, the hardware is the computer itself. (3)A program talks to a computer. (4)It tells a computer how to perform certain tasks, such as word processing or accounting. (5)The computer reads the program disk electronically by spinning it. (6)When you type on the keyboard you provide the computer with information and commands. (7)The program manual explains which keys, or combinations of keys, will activate these commands. (8)For instance, in word processing their are commands to delete words and sentences. (9)The program translates what you type into electronic impulses that the computer understands. (10)At the same time, the program translated electronic impulses from the computer into words and numbers on the screen. (11)With this technology, busineses can rely on computers for everything from inventories to accounting. (12)At home, individuals can write letters balance the family budget, and even shop for groceries. (13)The capabilities of computers are changing every day and with them the way we live our lives.

Sample Writing Skills Test Items

1. Sentence 2: **Programs, stored on magnetic disks, are also known as software, the hardware is the computer itself.**

   Which of the following is the best way to write the underlined portion of this sentence? If you think the original is the best way, choose option (1).

   (1) software, the hardware
   (2) software the hardware
   (3) software. The hardware
   (4) software, so the hardware
   (5) software and the hardware

2. Sentences 3 & 4: **A program talks to a computer. It tells a computer how to perform certain tasks, such as word processing or accounting.**

   The most effective combination of sentences 3 and 4 would include which of the following groups of words?

   (1) It talks to a computer
   (2) A program tells a computer how
   (3) and it tells a computer
   (4) or it tells a computer
   (5) A program performs certain tasks

3. Sentence 5: **The computer reads the program disk electronically by spinning it.**

   Which of the following is the best way to write the underlined portion of this sentence? If you think the original is the best way, choose option (1).

   (1) electronically by spinning it.
   (2) electronically. By spinning it.
   (3) electronically, by spinning it.
   (4) electronically; by spinning it.
   (5) electronically, however by spinning it.

4. Sentence 6: **When you type on the keyboard you provide the computer with information and commands.**

   What correction should be made to this sentence?

   (1) change *type* to *typed*
   (2) change the spelling of *keyboard* to *keybored*
   (3) insert a comma after *keyboard*
   (4) change *provide* to *provides*
   (5) no correction is necessary

5. Sentence 8: **For instance, in word processing their are commands to delete words and sentences.**

   What correction should be made to this sentence?

   (1) change the spelling of *instance* to *instanse*
   (2) remove the comma after *instance*
   (3) replace *their* with *there*
   (4) change *are* to *is*
   (5) no correction is necessary

6. Sentence 10: **At the same time, the program translated electronic impulses from the computer into words and numbers on the screen.**

   What correction should be made to this sentence?

   (1) replace *At the same time* with *Because*
   (2) remove the comma after *time*
   (3) change *translated* to *translates*
   (4) insert a comma after *impulses*
   (5) no correction is necessary

7. Sentence 11: **With this technology, busineses can rely on computers for everything from inventories to accounting.**

   What correction should be made to this sentence?

   (1) remove the comma after *technology*
   (2) change the spelling of *busineses* to *businesses*
   (3) change *can rely* to *could have relied*
   (4) insert a comma after *computers*
   (5) change the spelling of *inventories* to *inventorys*

8. Sentence 12: **At home, individuals can write letters balance the family budget, and even shop for groceries.**

   What correction should be made to this sentence?

   (1) remove the comma after *home*
   (2) insert a comma after *letters*
   (3) change the spelling of *budget* to *buget*
   (4) change *shop* to *shopping*
   (5) insert a comma after *shop*

9. Sentence 13: **The capabilities of computers are changing every day and with them the way we live our lives.**

If you rewrote sentence 13 beginning with

Our lives are being changed every day

the next words should be

(1) by
(2) so
(3) and
(4) that
(5) therefore

Answer Key

1. Content: Sentence structure
   Category: Run-on sentence
   Item Type: Sentence revision
   Answer: 3

   This item is similar to those used in the Diction and Style/Sentence Structure section of the current Writing Skills Test. The important difference is that the current test presents sentences of this type in isolation, while the revised test presents the sentences in paragraph contexts. The problem being tested in this case (a comma splice) is also a content area in the present test.

2. Content: Sentence structure
   Category: Coordination/Subordination
   Item Type: Construction Shift
   Answer: 2

   This item goes beyond mere sentence correction. The focus in this item type is usually on improving or varying a structure rather than on correcting an error. Because the item alternatives provide only the operative *parts* of the combined sentence, examinees must follow—at least partially—a process of composing sentences. This item type more closely imitates the actual process of writing. The correct answer is a simplified, clearer combination of the two sentences.

3. Content: Sentence Structure
   Category: Sentence Fragment
   Item Type: Sentence Revision
   Answer: 1

   The directions state explicitly that some sentences "may be correct as written." This item tests the ability to identify not an error but the correct absence of punctuation. Any other alternatives would either break the flow of thought or create a sentence fragment.

4. Content: Punctuation
   Category: Comma after introductory elements
   Item Type: Sentence Correction
   Answer: 3

   Note that this item includes "no correction is necessary" as the fifth alternative. Approximately half of the sentence correction items include this option as alternative 5, *and it sometimes is the correct answer.*

5. Content: Mechanics
   Category: Use of troublesome homynyms
   Item Type: Sentence Correction
   Answer: 3

   This item tests the frequent misuse of the homonyms *there* and *their*. This kind of mechanical error is usually tested by the sentence correction item type.

6. Content: Usage
   Category: Verb Tense
   Item Type: Sentence Correction
   Answer: 3

   Note that this item requires the examinee to refer back to the entire paragraph in order to select the verb form that is consistent with the verb tense established earlier. The directions which precede paragraphs in the Writing Skills test, Part I specifically alert examinees that their corrections must be consistent with the meaning and tone of the overall paragraph. Therefore, items which do rely upon the total context of the paragraph test *only* the categories of pronoun reference and verb tense errors. In each paragraph there are usually one or two items which require this kind of consideration of the total context.

7. Content: Mechanics
   Category: Spelling
   Item Type: Sentence Correction
   Answer: 2

   As with all spelling alternatives, the word *business* appears on the Master List of Frequently Misspelled Words. Examinees are also asked to know the plural, comparative, superlative, and adverbial forms of these words where applicable.

8. Content: Punctuation
   Category: Commas in a series
   Item Type: Sentence Correction
   Answer: 2

   Observe that here, as in all the items, each alternative is considered in the order in which it appears in the sentence.

9. Content: Sentence Structure
Category: Subordination
Item Type: Construction Shift
Answer: 1

Here the examinee is asked to change the structure of the sentence while retaining the original meaning. This item type demands the ability to manipulate words and phrases rather than identify errors. As a consequence, sentences tested by construction shift do not contain any errors. The ability to subordinate both clauses and ideas is tested in this item.

Writing Skills, Part II

The Language Arts panel of the GED Tests Specifications Committee recommended that writing be measured on the GED Tests directly as well as indirectly. The panel suggested that "candidates be asked to compose an expository writing sample, generally of the type requiring the writer to take a position and defend it with appropriate evidence, detail and argumental strategies." Accordingly, Part II of the GED Writing Skills test will be an essay writing exercise, as described below.

Content

In Part II of the GED Writing Skills test, examinees will be provided with a single topic which asks them to present an opinion or an explanation regarding a situation about which adults would be expected to have some general knowledge. Topics will be brief, identifying an issue or situation familiar to adults and asking a question about it. No specialized knowledge will be required in order to respond to a topic.

Examinees will be permitted at least 45 minutes to complete Part II of the Writing Skills test. Feasibility studies conducted by the GED Testing Service indicate that 45 minutes is an adequate amount of time for examinees to respond to the topic.

Format

Examinees will be asked to write their essays in an answer sheet booklet designed specifically for the purpose. The test instructions will encourage examinees to plan their responses and to make notes before writing their essays, and space for this purpose will be provided in the answer sheet booklet or through the use of scratch paper during the test administration. An example of the instructions that will accompany the essay topic is included below, along with a sample topic and essays.

Scoring

Over the past two years, the GEDTS staff has devoted considerable energy to determining the best method for scoring essays written by GED examinees. In keeping with the recommendations of the Language Arts Panel, each essay will be scored "holistically" on a six-point scale by two different readers, and by a third reader if the first two scores are more than one point apart. Essay readers will judge each paper based on its overall effectiveness rather than by analyzing papers for specific errors. All essay readers will use the GEDTS essay scoring scale, which draws readers' attention to elements of organization, support, clarity, and correctness of expression. A more detailed explanation of the scoring process, "How the GED Essay Is Scored," follows the sample topic and essays.

SAMPLE GED ESSAY TEST

Tests of General Educational Development
Writing Skills, Part Two

Instructions

This is a test to find out how well you write. The test has one question which asks you to present an opinion on an issue or to explain something. In preparing your answer for this question, you should take the following steps:

1. Read all of the information accompanying the question.
2. Plan your answer carefully before you write.
3. Use the blank pages of this test booklet (or scratch paper) to make any notes.
4. Write your answer on the separate answer sheet.
5. Read carefully what you have written and make any changes that will improve your writing.
6. Check your paragraphing, sentence structure, spelling, punctuation, capitalization, and usage, and make any necessary corrections.

You will have 45 minutes to write on the question you are assigned. Write legibly and use a ballpoint pen so that the evaluators will be able to read your writing. The notes you make on the blank pages (scratch paper) will not be scored.

Your composition will be scored by at least two trained evaluators who will judge the paper according to its overall effectiveness. They will be concerned with how clearly you make the main point of your composition, how thoroughly you support your ideas, and how clear and correct your writing is throughout the composition. You will receive no credit for writing on a question other than the one assigned.

SAMPLE TOPIC

The automobile has certainly been responsible for many changes in the United States. Some of these changes have improved our lives and some have made life more difficult or unpleasant.

Write a composition of about 200 words describing the effect of the automobile on modern life. You may describe the positive effects, the negative effects, or both. Be specific, and use examples to support your view.

Refer to the steps on the directions page for more specific instructions about writing your composition.

All topics used with GED examinees during the studies remain secure test questions (for possible use in 1988) which cannot yet be published, nor can the examinees' responses. However, we are able to provide the example topic above, which was used with a national sample of high school seniors. The responses printed below were written by high school seniors; the scoring scale used to score the papers is the same as that used to score GED examinees' papers. The GED Essay Scoring Guide follows the samples, along with the actual scores awarded the papers.

E1

The effects of the automobile on American has its good points and bad points. I will discuss some of these effects as I am writing.

The goods effects of the automobile are many. The automobile has helped us get were we want to in a shorter time. It has helped us travel long distances in comfort. In cold weather, it has helped us stay warm while hunting or just driving down the road. In hotter weather, it has helped us stay cool and comfortable with air-condetioning. The four-wheel drive has helped us get through deep snow and mud in the Spring and winter.

Some bad effects of the automobile are that it has caused much pollution and accidents. It has made us maniacs of the highway. It has created more deaths and new laws

in this world. It has caused some people to drive fast and get hurt doing it. It has caused the production of tires and more steel. In ways it has helped and in others it has hurt us.

E2

~~The invention of the automobile has certainly done more good for more people~~

The good that the invention of the automobile has done for the world, in terms of convenience, time and labor, certainly outweighs the problems it has caused. The invention of the automobile has created a tremendous job market in the united states and other auto manufacturing countries. What's more, it has the need for fuel to operate all the cars, trucks, and motorcycles on the road today has helped to create thriving, modern countries where backward, third-world countries were once predominate.

On a smaller scale, the automobile has tremendously benefited such people as farmers, who can transport goods much quicker today than just a century ago. Productivity in a variety of businesses has increased because important materials and information can be delivered in hours where it used to take days or weeks. Moreover, treatment of the sick or injured is now more efficient because necessary machinery or medicines can be rapidly obtained, not to

mention the fact that patients themselves can be transported to hospitals much more quickly; A tremendous great benefit. where time can be the difference between life or death.

Even With all the ~~good~~ services that automobiles provide, there are still some major drawbacks. Some of these, like accidents due to faulty construction, are being slowly but surely removed as science and technology advances. Others, such as drunk driving, may never be eliminated, but their frequencies can certainly be lessened as public awareness and outcry increasess.

There are other problems, too; how automobiles affect the ecology of our planet, dense traffic, increasing hazards due to increasing driver population, to name a few. All of these however, ~~do not contain~~ are not reasons to oppose the automobile production. As described, automobiles are not only beneficial but necessary to today's world. These problems will just have to be dealt with in time.

E3

Many of these effects are negative. For many of us, a close relative, friend, or someone beloved has been killed due to automobiles accidents. Many occur under certain circumstances like, driving while drinking, not paying attention to the road, but most of are they are most likely to occur when someone is driving at a high speed.

I think that cars are helpful, but not really necessary We can always find other ways of transportation; therefore, less accidents would not occur.

E4

The automobile has meant a great deal to the de-centralization of the American family. The increased transportation possibilities have caused the tradition of an entire family living in the same area to end, for now it is very easy to leave. Therefore, ~~modern society is~~ people in modern society are much more independent and self-reliant.

Another effect the automobile has had on modern society is seen in the teenage culture. To most teens, a car means freedom and a chance to do things on their own, away from their parents. Increased social activity is available once a teen receives his license. This means that kids are growing up even faster than before.

Finally, although the widespread use of the auto has meant the spreading out of the family, it also means that it is easier for them to travel to reach each other. It has brought together people who might have otherwise never been able to see each other.

E5

Automobile has been a positive effects in many peoples life today, it is a deep pleasure to a lot of us. Most of all about automobile is a good use for elders people who can't get around. It is also a good use for traveling because it is very hard to walk to California, but when there is an automobile around you have it made. I think an automobile is one of the best thing a human can have. In case of an emergency, there are Ambulance, police cars, and etc. It also can get you to the hospital most easy, and may get you there in time enough to save your life. There are many kinds of automobiles in the world's today. I think they are very important in some ways, like grocery shopping, going to work, and etc. Automobile is also a negative effect in many people life today, most of all it deals with teenage, there are more teenage involved in automobile accident in the world today, because of Alchol beverages. A automobile is

nothing to play around with. It is a dangerous vechile which have destoryed many people life you this world today. When you are drinking alchol dont drive an automobile because it is leading you on to death. It is a sudden way you are suppose to handled a vechile, such as the way your speed. Most of the automobile comes from racing to, like I said an automobile is nothing to play around with. For parents they should have safety in the case such when they have a little baby with them, they should have a car seat for the baby, it is against the law to have a baby while driving. That cause an automobile accident. Some Automobile are misused used by many peoples, because they don't know about automobile and the way they can harm you. You have to be very carefully when you are about to get your very on vechile, be very sure to have all parts of the vechile checked by a meachine, because

anything could be wrong with the Automobile. So you have to be very careful with them, because they will ~~load~~ lead you on to death.

E6

The modern day automobile has several affects, ~~on our civilization~~, both positive and negative, on our civilization. On a positive viewpoint, the automobile can be considered essential to our lifestyle. Today's world is much more fast-moving than before. People have deadlines to meet, and, without the use of the automobile, it would be difficult to uphold these obligations. Also, the transportation of goods makes the automobile neccessary. For example, if a company were to ship its goods over a fifteen mile distance, it would be much more economical to use a truck rather than a train or plane. The automobile also gives its owner a sence of freedom. If an owner of an automobile has a weekend off, for instance, he can take that short ~~trip for the~~ vacation he would not have had if he did not have an automobile. In these ways, the automobile tends to serve civilization well. It does, however, have its drawbacks.

The automobile has caused several problems in today's society. It has ~~caused~~ unquestionably added to the problem of pollution. The exhaust of an automobile has increased the problem of air pollution considerably. The installation of catylitic converters and the installation of emission controls has lessened the

problem, but has by no means solved it. Noise pollution is another situation to be recognized. A crowded free-way during rush hour can be very disturbing to any nearby residents. I have seen no solution to this problem, for, while it is possible to make an engine quieter, it is impossible to keep a motorist from blowing his horn. Traffic fatalities must also be considered. Lowering the national speed-limit to 55 miles per hour has helped, but again, this has not solved the problem. By reviewing these arguments, the automobile may be considered a hazzard to modern day civilization.

All in all, while the automobile has aided our modern world in many ways, it still has its drawbacks. If these drawbacks can be ironed out, the automobile may be considered a tremendous asset by any standards.

JH

E7

The automobile was designed as a means of transportation. as the years passed by the automobile has increased in quality size and comfort. the public society ~~steer~~ has argued that the automobile gives off too much pollution as do the factories. these facts about the automobile are all true about automobiles and their manufacturer but little has changed. Some states require a check on your car each year for pollution causing factors and if any are found they must be corrected. I believe that each state should help in the economizing of automobiles and prevent them from polluting the general publics air.

E8

Automobiles were only affordable to the rich, when they first came out. As time past, the auto industry has become more advance. Automobiles were used by the rich to impress others of their good fortune. There were only a few people who could afford them. But, today everyone ~~at~~ owns at least 1 car.. There are many advantages and disadvantages of cars today. ~~But~~ There's one common purpose of them, their ability to get you somewhere in a hurry.

The advantages of owning a car comes from the car you bought. A porshe ~~ga~~ gives you pleasure in showing off or just cruising to impress the girls. A conventional car is used to take the kids to school, or just ~~of~~ run errands. A family car is used ~~on~~ to take family trips or just have a nice ride in the country. Cars comes in many shapes and sizes, ~~it can~~

The disadvantage of owning a car is having to pay for it. There's alot of responsibilities that comes in owning a car. Your faced with monthly notes,

insurance, and repairs. Theirs also the problem of putting gas in your car. Gas can be pretty expensive when your on a tight budget. As you grow older, you become more Conservative with your money. You try to pick out the car that gives you more gas to the miles instead of a car ~~to~~ that looks good and guzzle up your gas.

In conclusion, cars can be a useful tool or a destructive tool. Its according to how you use it. Managing your money is a big part in owning a car and if your not quite ready to drive a car. Your putting your life and maybe someone else's in danger.

E9

The automobile is a product of human ingenuity. It was made, like every thing else, to preoccupy us, to distract us from reality. The man who made it is rich and happy. The man who crashed it didn't care. We must understand that all things put on this disgusting, Evil world was created to keep us busy or playing so that we don't have time to think about who made us and why he did it. We know that we are here and that's all we need to know As long as we have toys to play with. We know that us being the highest form of life, every thing IN our power including INFERIOR people, ANIMALS, And Machines were made FOR personal gain and superiority. Everything we own and Everybody we know will either be used or will take advantage of Someone not as great, who EVER made us is more powerful than we are or he couldn't have created us therefore we too ARE being used. Just By living we are satisfying someone else's

needs. We were meant to be born to live an average life then to die satisfied and content. If we do that we are serving the purpose of our Dictator Creator. We will have succeded in carrying out his plan. He will have succeded in using us. He continues to mislead us. We don't why we were made and where we will go after we die because he doesn't want us to know. People think they have life great and should be satisfied with what they have. But people starving in other countries don't know how bad they have it because they don't know of our lives. God made people less fortunate because the people who have it better will think they really have it great and they think who ever made them is just as great. But we don't have someone to really compare ourselves to we won't live long enough to see what great really is. If we go by our creators plan. We must defy his plan and refuse to conform will his plans.

We must not be satisfied with an average life selling used cars. We must not carry out his orders. We must do the one thing that he doesn't want us to. IF the things I bought didn't serve there purpose they would be useless. IF I didn't serve my creator purpose I would then be useless to him and he would be deprived of a servant. We must turn the swords upon ourselves and decide our own FAte INstead living a story made to Entertain an Evil Nothing.

The Devil is never a MAKer

But the Less that you give MAkes you A tAKer.
But it goes ON and on and ON.
Think about it hArd

GED Essay Scoring Guide

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Papers will show *some or all* of the following characteristics.

Upper-half papers make clear a definite purpose, pursued with varying degrees of effectiveness. They also have a structure that shows evidence of some deliberate planning. The writer's control of English usage ranges from fairly reliable at 4 to confident and accomplished at 6.

6 Papers scored as a 6 tend to offer sophisticated ideas within an organizational framework that is clear and appropriate for the topic. The supporting statements are particularly effective because of their substance, specificity, or illustrative quality. The writing is vivid and precise, though it may contain an occasional flaw.

5 Papers scored as a 5 are clearly organized with effective support for each of the writer's major points. The writing offers substantive ideas, though the paper may lack the flair or grace of a 6 paper. The surface features are consistently under control, despite an occasional lapse in usage.

4 Papers scored as a 4 show evidence of the writer's organizational plan. Support, though sufficient, tends to be less extensive or convincing than that found in papers scored as a 5 or 6. The writer generally observes the conventions of accepted English usage. Some errors are usually present, but they are not severe enough to interfere significantly with the writer's main purpose.

Lower-half papers either fail to convey a purpose sufficiently or lack one entirely. Consequently, their structure ranges from rudimentary at 3, to random at 2, to absent at 1. Control of the conventions of English usage tends to follow this same gradient.

3 Papers scored as a 3 usually show some evidence of planning or development. However, the organization is often limited to a simple listing or haphazard recitation of ideas about the topic, leaving an impression of insufficiency. The 3 papers often demonstrate repeated weaknesses in accepted English usage and are generally ineffective in accomplishing the writer's purpose.

2 Papers scored as a 2 are characterized by a marked lack of development or inadequate support for ideas. The level of thought apparent in the writing is frequently unsophisticated or superficial, often marked by a listing of unsupported generalizations. Instead of suggesting a clear purpose, these papers often present conflicting purposes. Errors in accepted English usage may seriously interfere with the overall effectiveness of these papers.

1 Papers scored as a 1 leave the impression that the writer has not only *not* accomplished a purpose, but has not made any purpose apparent. The dominant feature of these papers is the lack of control. The writer stumbles both in conveying a clear plan for the paper and in expressing ideas according to the conventions of accepted English usage.

0 The zero score is reserved for papers which are blank, illegible, or written on a topic other than the one assigned.

Commentary on Sample Essays

Sample	Score	Comment
E1	3	The writer of paper E1 states a thesis that sugges s an appropriate controlling idea for the essay. This initial effort is flawed, however, by the awkward phrasing, the agreement error ("efforts... has"), and by the self-conscious statement of the writer's plan of development. The body of the essay shows evidence of organization but little depth of thought. The writer uses only the most obvious examples and repetitious sentence structure ("It has made...," "It has created...," "It has caused...") to provide support for the main idea of each paragraph.
E2	6	The opening sentence of paper E2 is distinctive in its statement of an assertion at the same time that it imposes a principle of organization on the writing that follows. The writer provides adequate and convincing support for the assertion, and goes beyond the bounds of normal expectations through the rhetorical technique of refuting the arguments that oppose the assertion. The essay is by no means perfect—the writer exhibits some confusion over the use of the semicolon, for example—but it shows writing that is consistently smooth and confident, even elegant. It is worth noting, too, that the paper is no longer than many efforts of lesser distinction.
E3	2	Paper E3, like many in the lower half of the score scale, begins abruptly, offering the reader no hint of either the topic or a controlling idea. The paper suffers from a serious lack of development and awkward phrasing ("Many occur under certain circumstances..."), along with an inattention to detail ("therefore, less accidents would not occur.").
E4	4	The content of paper E4 clearly exhibits a higher level of thought than that of most lower half papers. The writer concerns himself exclusively with the social effects of the automobile and expresses the more substantive ideas with a good deal of facility. The paper, however, suffers from the lack of a controlling idea: the first sentence gives the impression that the essay will concern itself with the de-centralization of the American family, but subsequent paragraphs address other social aspects of the automobile. Finally, the paper could have been improved substantially with the addition of more extensive or detailed support.
E5	1	The first sentence of E5 produces the immediate impression that the writer is unfamiliar with usage and sentence structure conventions, and this impression is sustained throughout the paper. Though the writer shows evidence of some occasional wit (whether intentional or otherwise), thoughts about the topic appear to be in random order, though they are roughly organized according to the advantages/disadvantages scheme. The overall impression derived from a reading of this paper is of a collection of thoughts about automobiles, expressed in a stream-of-consciousness fashion, without regard for planning or correctness of expression. This paper serves as an excellent reminder that, when it comes to writing, length is not always a correlate of quality.
E6	5	Paper E6 is a good example of an essay that gets stronger as it progresses. The writer uses a simple contrast to organize the paper and presents considerable detail to support each of the main points. The details supporting the negative side of the issue, however, are far more analytical, and thus convincing, than the details provided for the positive side. The writer also uses transitions effectively and provides an appropriate concluding paragraph. At the sentence level, the writing is smooth and controlled, the writer clearly comfortable at expressing ideas in written form.

Sample	Score	Comment
E7	3/2	Paper E7 illustrates an essay that would earn a score of 3 from one reader and a 2 from a second reader. This essay demonstrates the level of writing ability attained by the average GED examinee in the essay feasibility studies. The paper has an apparent focus—the pollution caused by automobiles—but the writer fails to maintain the focus and to elaborate ideas in support of it. The first sentence of the essay gives a hint to one of the paper's overriding weaknesses—the tendency towards the general or obvious. This tendency is evident in phrases such as: "the automobile has increased in quality and size and comfort." Another significant flaw in the writing is the lack of clarity and precision in the diction: "public society," "These facts about automobiles are all true about automobiles," and "general public's" are all examples of redundancies which contribute to the impression that the writer is working very hard to fill empty space on the page.
E8	4/3	Paper E8 represents an essay in the middle of the score range, earning an upper-half score from one reader and a lower-half score from a second reader. The writer experiences some difficulty establishing a firm direction in the first paragraph, and provides only general or obvious ideas by way of support in the second paragraph. The writing becomes slightly stronger in the remaining two paragraphs, though usage errors present some interference. The control of sentence structure tends to place this paper in the upper half, while the inability to develop a controlling idea argues for a lower half score, thus placing the paper in the middle.
E9	Off Topic	Paper E9 warrants a zero score because the writer has *intentionally* written on a topic other than that provided. The fact that this writer has used the prompt provided in the topic as a springboard to a personal diatribe is not a sufficient connection to the topic to consider the effort scoreable. "Topicality" is often a difficult issue for readers who are accustomed to evaluating student writing in the classroom. There is, of course, a very critical difference between classroom writing assessment and large-scale writing assessment. In the former, the topic and teacher expectations can be explained in detail and elaborated if students continue to have questions. In large-scale assessments, a single question must somehow serve for a vastly diverse population, and no elaborations are permitted beyond what is printed on the page. Because of this limitation, a response to a topic in large-scale assessment is normally considered on the topic as long as the writer demonstrates an intention to write on the topic provided and not on some other. A paper is either on topic or off. If it is off, only the chief reader may assign the grade of zero. If it is on topic, the paper is scored in the same way as all other papers, using the same scoring guide; in other words, no "silent penalties" should be assessed a paper because the writer took a slightly different view of the topic than the one intended.

How the GED Essay Is Scored

Holistic Scoring

Each paper written for the GED Writing Skills Test is scored by two trained readers. The readers score the papers "holistically;" that is, the piece of writing is evaluated on the basis of its *overall* effectiveness. The salient features of holistic scoring are well described by Conlan (1976):

> The basic assumptions of the holistic reading are that each of the factors involved in writing skill is related to all the others and that no one factor can be separated from the others. Readers must judge each essay as a whole; they must read each paper for the impression its totality makes. A misspelled word, a comma splice, a sentence fragment, a misplaced modifier should carry no great weight in scoring a paper. The candidate is entitled to make some mistakes: he or she is writing hurriedly in a tense situation, without recourse to a dictionary, without the customary time for deliberation. If readers read each paper as a whole, then, they are better able to judge the competence of the writer. If the paper is poorly written, that will be part of the reader's first impression; there is no need to analyze it word by word to decide that it is badly done. If the paper contains mistakes because the writer, though capable, has been forced to hurry, the reader will judge the general quality of the paper most effectively by reading it as a whole. The motto of the reading might well be "Read quickly and judge. Do not re-read."

The Six Point Scale

The score scale used by each reader in the holistic evaluations ranges from one (low) to six (high). The two readers' scores are then added, resulting in a range of scores from two to twelve. If the two readers' scores differ by more than one point, the paper is scored a third time. The total score for papers scored by three readers is twice the average of the three scores.

Because the six point scale is an even-numbered scale, there is no midpoint. The lack of a midpoint forces readers away from a natural tendency to drift towards the middle. With an even-numbered scale, readers must decide whether each paper belongs in the upper half or the lower half of the papers being scored. Readers can make this decision only if they have some awareness of the total range of writing ability represented by the papers; this is provided by sample papers in conjunction with a descriptive scoring guide.

How the Standards are Defined

The standards for an essay scoring session are defined by the GED essay scoring guide and by sample papers illustrating the different points on the scoring scale. These standards were originally established by examining papers written by a national sample of high school seniors and will be maintained by following the same process for each topic that is used in the GED Writing Skills Test. A group of highly experienced readers reads papers in the pool of high school essays to establish the range of abilities demonstrated by the norming population of (high school) students. After they have selected papers which represent the full range of ability, the readers assign the top score to the best of the papers, the lowest score to the weakest papers, and corresponding scores to other papers throughout the range. The readers' judgments during this process are made independently, and the papers that ultimately serve as samples include only those on which the readers' scores agree. These sample papers represent the full range of abilities demonstrated by a national sample of high school seniors and thus serve as standard setters, or "rangefinders."

The GED Essay Scoring Guide

The GED essay scoring guide is a further articulation of these standards and accompanies the rangefinders in training sessions. Because it was developed inductively, the scoring guide is descriptive rather than prescriptive. That is, after the readers selected the rangefinders, they attempted to describe, in general terms, the characteristics of papers at different points on the scoring scale. While the sample papers illustrate standards only for the specific topic on which they are written, the scoring guide defines the characteristics papers should exhibit regardless of the topic the paper is written on. Although there is ample research demonstrating that different topics exhibit different strengths and weaknesses of a writer, a generic guide can be used if topics are developed with the scoring guide in mind. All topics developed for use in the GED Tests are of the same rhetorical type and are of approximately equal length, reading level, and format. In addition, all potential topics are field tested and scored by trained readers, using the GED scoring guide to define standards. If readers find that papers written on a potential topic cannot be scored using the scoring guide, or that papers consistently exhibit traits other than those described in the guide, the topic is rejected. A further check on the match of topic to scoring guide is made through a statistical analysis wherein the mean and variance of examinee scores on potential topics

must approximate the mean and variance of the anchor topic for which the scoring guide was written.

Training of Readers

While the specific procedures for training readers and conducting the essay scoring session depend upon the number of papers to be scored and the number of readers participating, many of the basic principles remain the same regardless of the size of the effort. Readers are usually trained prior to or at the beginning of the essay scoring session. After an introduction to the principles of holistic scoring provided by a chief reader, readers are given the topic, the scoring guide, and the rangefinders, which include at least one paper at each point on the score scale. After a discussion of the tasks required by the topic and a review of the qualities enumerated on the scoring guide, readers are asked to read the entire set of rangefinders, evaluating them swiftly on the basis of an overall impression and ranking them from best to poorest. Because the set of rangefinders includes more papers than there are points on the score scale (i.e., 8 papers for a six point scale), readers are instructed that they must use the entire range of scores. This is an important instruction in the training because many readers are reluctant to award scores at the top or at the bottom of the score scale. If readers are directed to give the top score to the best paper in the set of rangefinders, they are more likely to acknowledge that a "6" paper does not—and need not—represent perfection.

In a large group training session, the chief reader calls for a show of hands to indicate how readers scored the rangefinders. Ideally, all of the readers will have scored each of the rangefinders identically. In some readings, involving highly experienced readers, this ideal is realized. However, with inexperienced readers there are often substantial differences among readers' scores at this point. To help resolve those differences, readers designated as "table leaders" conduct discussions among the four to six readers at their tables to attempt to bring each individual to a point of consensus with the group. At the heart of the holistic scoring process is the necessity for each reader to be willing to accept—and in some cases consciously shift to—the standards defined in the scoring guide and adopted by the group. Following the discussion of the rangefinders, additional work is done towards this goal through the scoring of more sample papers, distributed singly or in sets of two or three. The scoring and discussion of sample papers continues until the entire group of readers begins to show a consensus in their scoring. At this point, the training period ends and the actual scoring of essays begins, although table leaders may continue to work with individual readers if necessary.

Reliability and Stability

The goals of an essay scoring session are inter-rater reliability and reading "stability." Inter-rater reliability is the degree to which readers agree with each other; generally, the fewer papers which require a third reading, the greater the inter-rater reliability, though this index is affected by other variables as well. Reading stability is the degree to which papers are scored according to the fixed standards described in the scoring guide. This is a particularly important feature of an essay scoring session because the standards for scoring GED essays must remain fixed, regardless of when the essay is administered, where it is scored, or what specific procedures were used in the scoring session itself. It is important to note that a high degree of inter-rater reliability does not ensure reading stability. In short, just because readers are agreeing with each other on essay scores does not mean that they are assigning the scores according to the standards defined on the scoring guide.

To achieve these two goals, the reinforcement of scoring standards continues well after the initial training session is over. As the readers score papers, a table leader (in a large reading) or chief reader (in a small reading) selects scored papers at random to verify that the scoring is consistent with the definitions in the scoring guide. In cases of a disagreement, the chief reader or table leader discusses the paper with the reader. The monitoring process continues throughout the entire scoring session, and, in large readings, the chief reader periodically reviews the scoring of the table leaders.

When scoring large numbers of papers, readers generally read for periods from 30 to 45 minutes at a time and then take breaks. At the beginning of each reading period, additional sample papers are distributed and scored as an additional check on reader accuracy. Generally, readers score between 30 and 50 papers per hour, depending on various factors such as the reader's experience, the length of the papers, and the time of day. Readers are encouraged to read swiftly because a slow, deliberate reading of a paper tends towards analytical, rather than holistic, evaluation of writing. But readers are frequently reminded that accuracy is far more important than speed. Through this system of checks and re-checks, some assurance is gained that all readers are scoring according to the standards defined by the scoring guide and not according to one defined by each individual.

Social Studies

At the recommendation of the Social Studies Test Specifications Panel, the Social Studies Test will continue to use items that measure integrated, comprehensive skills as well as the important concepts and principles that are the lasting outcomes of a high school social studies education. There are no dramatic changes in the test, but there are three developments of note. One, single items in the new test will often incorporate a combination of economic, political, geographic, and historical principles, a testing approach that more closely resembles realistic decision-making and problem-solving. Two, across the content areas, the test addresses global issues including the interdependence of individuals and nations. Three, the test requires more higher level thinking skills; that is, it poses more questions that require a variety of thinking processes to arrive at the answer.

Content

The content and emphasis of the Social Studies Test remain essentially the same as that of the current tests. The content for social studies includes

A. History (including global issues): 25%
B. Economics: 20%
C. Political Science: 20%
D. Geography: 15%
E. Behavioral Science (Anthropology, Psychology, Sociology): 20%

Following the recommendations of the GED Tests Specifications Committee, the primary emphasis of the test is on the measurement of *integrated, comprehensive skills obtained from an overall study of the social studies* rather than on discrete concepts from various subject areas. A given test item may, therefore, relate to more than one subject area. For example, an item dealing with legislation on conserving national forest land might incorporate concepts from political science, economics, and geography. Further, an item set which explores the work of the United Nations explores history, world affairs, and economic facts and statistics.

To illustrate further the notion of testing integrated skills, it may be helpful to consider the roles in which individuals are portrayed in the test contexts. Individuals may be viewed as acquirers, users, and communicators of information. From the perspective of the social studies, the acquirer, user, and communicator of information functions as an individual and as a member of social groups ranging in size from the family, to the local community, to the nation, and to the global community.

Context

Social Studies items are designed to be relevant to the GED test population, with an emphasis on settings familiar to daily life. Often questions address situations in which the individual is citizen, consumer, or worker. Some items address the impact of technology and computers on everyday living, such as changing the work force or altering the natural environment and standard of living.

Format

All social studies items are multiple choice questions based on either a written stimulus (e.g., editorials, speeches, popular magazine and journal articles, primary sources, etc.) or a graphic stimulus (e.g., graphs, tables, charts, diagrams, cartoons). Two thirds of the questions have prose stimuli; one third have graphic stimuli. Single items consist of up to about 40 words or a graphic stimulus. Item sets consist of up to 250 words or a graphic stimulus accompanied by 6-7 questions. Two thirds of the questions are in items sets; one third are single, or stand-alone items. *A new item type*, illustrated below, calls for higher level cognitive skills. It requires the examinee to categorize ideas, events, and issues according to definitions that are provided.

Cognitive Levels

The 1988 Social Studies Test will test higher level skills that often assume prior knowledge of important social studies principles, concepts, and events and that require use of that knowledge. No items will test only recall of information. The change in skills emphasis demonstrates the new shift to testing higher level skills. The social studies items are classified according to the following cognitive levels, based on an adaptation of Bloom's taxonomy (*Taxonomy of Educational Objectives*, Benjamin S. Bloom, ed. et al., 1958).

1. **COMPREHENSION** (20%) items require understanding the meaning and intent of written and graphic stimulus material. They measure the ability to:
   - restate information
   - summarize ideas
   - identify implications
2. **APPLICATION** (30%) items require the ability to use information and ideas in a concrete situation. They measure the ability to:
   - use given or remembered ideas in a context other than that provided

3. **ANALYSIS** (30%) items require the ability to break down information and to explore relationships of component ideas. They measure the ability to:

   - distinguish facts from hypotheses or opinions
   - recognize unstated assumptions
   - distinguish a conclusion from supporting statements
   - identify cause and effect relationships

4. **EVALUATION** (20%) items require the ability to make judgments about the validity or accuracy of information or methods based on provided or assumed criteria. They measure the ability to:

   - assess the adequacy or appropriateness of data to substantiate hypotheses, conclusions, or generalizations
   - recognize the role values play in beliefs and decision-making
   - assess the accuracy of facts as determined by documentation or proof
   - indicate logical fallacies in arguments

Sample Social Studies Items

Item 1 refers to the following information.

After the Civil War, the cause of black voting rights was aided by three new amendments to the Constitution. The Thirteenth Amendment outlawed slavery. The Fourteenth Amendment granted blacks national and state citizenship. Finally, the Fifteenth Amendment granted the right to vote to any male adult, regardless of race.

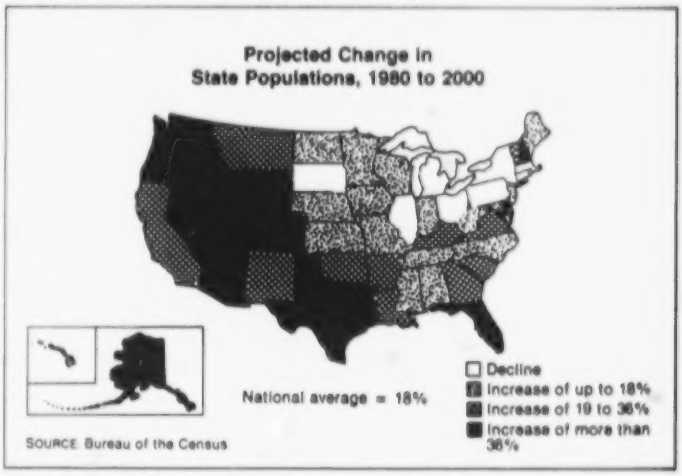
1. Which of the following best describes the purpose of these amendments?

   (1) to guarantee economic opportunity for freedom
   (2) to grant citizenship rights to black Americans
   (3) to allow slaves the right of assembly
   (4) to protect all citizens from illegal search and seizure
   (5) to guard against the abuse of slavery

2. When earlier learning interferes with the learning of new material or new skills, it is known as negative transfer. Which of the following is an example of negative transfer?

   (1) A child who can draw with crayons learns to write on a blackboard with chalk.
   (2) Student drivers practice driving on a simulator before getting into a car.
   (3) An employee who uses a personal computer at home manages a data processing system at work.
   (4) A typist switches readily between manual and electric typewriters.
   (5) A person who first learned German in school finds it difficult to learn Spanish.

Items 3 to 6 refer to the following map.


Projected Change in
State Populations, 1980 to 2000
National average = 18%
Decline
Increase of up to 18%
Increase of 19 to 36%
Increase of more than 36%
SOURCE: Bureau of the Census

3. Based on this map, which of the following states is expected to have the largest percentage increase in population?

   (1) New York
   (2) Arizona
   (3) California
   (4) Illinois
   (5) Georgia

4. According to the map, a construction company established in the late 1980's or 90's would be most likely to explore new building projects in which of the following areas?

   (1) Great Lakes
   (2) New England
   (3) North Central
   (4) South Atlantic
   (5) Pacific Northwest

5. Which of the following statements is the most likely explanation for the projected population increase in Florida, Texas, and New Mexico?

   (1) More employment opportunities are becoming available in these areas.
   (2) The need for goods and services is declining in these areas.
   (3) The average age of retirement is increasing in these areas.
   (4) A general population shift to the Pacific Northwest is occurring.
   (5) More women are entering the work force.

6. Which of the following statements is suppported by the data provided by the map?

   (1) The standard of living will improve in Texas and Idaho.
   (2) The total number of Congressional representatives in the country will decrease.
   (3) Congressional representation may decrease in Pennsylvania and New York.
   (4) The overall population of the country will decrease.
   (5) Congressional representation will increase in Pennsylvania and New York.

Items 7 to 8 refer to the following article.

One important component of crime is often neglected: the victim. John Laub, assistant professor of criminal justice at Northeastern University, believes victims are as important as criminals in understanding the dynamics of crime. He tried to learn more about why some groups of people are victimized more than others.

In order to understand victims, their age, race, sex, geographic location, and the kind of crime committed against them must be determined. In The National Crime Survey, what the data reveals is that the typical victim of a street crime usually is male, between the ages of 16 and 25. This also is generally true for the typical criminal in street crimes.

With the exception of rape, fewer crimes are committed against women and the elderly than against men. Laub said this is a result of the high "fear rate" women and the elderly have.

"Because they are more afraid of crime, women and older people tend to be more cautious," Laub noted. "They don't walk along dark streets, or go into neighborhoods which are known to be in high crime areas."

Conversely, men, specifically those in the 12 to 19 age bracket, have low fear of crime. They usually do not change their behavior when they are in a high crime-risk situation, and therefore have a higher rate of victimization.

From Maureen Staley, "Fear Lowers The Odds." *Northeastern Alumni Magazine*, Vol. 8, No. 5, May/June, 1983.

7. Which of the following is the central hypothesis suggested by Laub's study?

   (1) Men are the victims of crime more often than women.
   (2) Victims tend to be fearful people.
   (3) Women witness more street crime than men.
   (4) Young men fear crime less than do women and the elderly.
   (5) The typical victim of street crime is cautious.

8. Which of the following statements in the article is best supported by evidence presented in the article?

   (1) Victims are as important as criminals in understanding the crime rate in the country.
   (2) Crime occurs more frequently in metropolitan areas than in rural areas.
   (3) Men are victims of crime less often than women.
   (4) Men between the ages of 16 and 25 are more likely to be the victims of street crime.
   (5) Men are more often the victims of crime because they have less fear.

Items 9 to 11 refer to the following information.

Political systems are classified according to the way the power to govern is distributed among groups in a society. Listed below are five types of political systems and brief descriptions of how power is distributed.

(1) direct democracy—all qualified individual citizens are free to participate in the lawmaking process

(2) representative democracy—legislators, elected by the people in free and open elections, debate and vote on public issues to determine the laws

(3) oligarchy—a small privileged group, unchecked by a legislature or the citizens, determine the laws

(4) constitutional monarchy—a constitution recognizes the inherited ceremonial power of a royal family, but a representative assembly determines the laws

(5) dictatorship—an individual who holds absolute power, unchecked by a legislature or the citizens, determines the laws as well as economic and social policy

Each of the following statements describes a process that takes place in one of the political systems described above. Choose the system in which the process described would most likely occur. The categories may be used more than once in the set of items but no one question has more than one best answer.

9. A group of men and women, chosen by popular vote in their communities, meet in the nation's capital to discuss and vote on a proposal to buy new aircraft for the nation's air force. The type of political system described is a(n)

(1) direct democracy
(2) representative democracy
(3) oligarchy
(4) constitutional monarchy
(5) dictatorship

10. A military force succeeds in taking over a nation's capital and overthrowing the government. The rebel leader disbands the national legislature and establishes himself as president and sole lawmaker. The type of political system described is a(n)

(1) direct democracy
(2) representative democracy
(3) oligarchy
(4) constitutional monarchy
(5) dictatorship

11. Residents of Crossroads, Alabama meet to discuss and vote on a proposal to buy a new fire truck for the town's volunteer fire company. The type of political system described is a(n)

(1) direct democracy
(2) representative democracy
(3) oligarchy
(4) constitutional monarchy
(5) dictatorship

Answer Key

1. Content: History/Political Science
   Cognitive Level: Comprehension
   Objective: Summarizes information about amendments to the Constitution
   Answer: 2

   This item tests a simple comprehension skill: it requires that the examinee summarize historical facts. The answer is the most precise summary of the rationale for and the effect of the three amendments.

2. Content: Behavioral Science/Psychology
   Cognitive Level: Application
   Objective: Identifies a human behavior
   Answer: 5

   This item tests comprehension and application skills, requiring the examinee to understand first the meaning of a concept in behavioral psychology and, second, to identify an example of the concept in everyday life. The answer is the only learning experience, among the choices provided, in which previous experience blocks acquiring a new skill.

3. Content: Geography/Economics
   Cognitive Level: Comprehension
   Objective: Interprets data provided by a map
   Answer: 2

4. Content: Geography/Economics
   Cognitive Level: Application
   Objective: Uses data provided by a map to make a decision
   Answer: 5

5. Content: Geography/Economics
   Cognitive Level: Analysis
   Objective: Identifies probable cause for developments portrayed on a map
   Answer: 1

6. Content: Geography/Economics
   Cognitive Level: Evaluation
   Objective: Recognizes adequacy of data provided by a map
   Answer: 3

   Items 3-6 test all four cognitive levels as well as prior knowledge in the social studies. The set tests the ability to interpret information provided by a map; to apply information, concepts, and principles in geography, economics, and political science; to explore relationships between information and ideas; and to judge whether adequate evidence is provided to draw certain conclusions.

   For item 3, alternative 2 is the correct answer, chosen as a result of reading and understanding the implications of the map legend and identifying Arizona, in the Southwest, as the area of largest projected growth. For item 4, alternative 5 is the correct answer, requiring comprehension of the information provided by the map, identification of regions and their projected growth potential, and recognizing the reasonable link between population growth and the demand for land development. Item 5 requires the examinee to identify the economic development that might reasonably lead to or cause a population increase, especially a shift in population from one part of the country to another. Alternative 1 is the key, linking population increase with job opportunities. Item 6 tests the ability to judge which prediction is reasonable based on evidence provided by the map. Alternative 3 is the key as the projected population decrease in Pennsylvania and New York may lead to a reapportionment of congressional representation.

   This item set illustrates how graphic material generates information and questions that integrate several content areas and test thinking skills that range from simple comprehension to the more complex application, analysis, and evaluation processes.

7. Content: Behavorial Science/Sociology
   Cognitive Level: Analysis
   Objective: Identifies an hypothesis and distinguishes it from a fact
   Answer: 4

8. Content: Behavorial Science/Sociology
   Cognitive Level: Evaluation
   Objective: Evaluates information sources and draws warranted conclusions
   Answer: 4

   This item set tests the two higher level thinking skills, analysis and evaluation, with a sociological content relevant to adult learners. Item 7 requires the examinee to understand the ideas and information presented in the article and then to distinguish between accurate and inaccurate relationships among groups of people, attitudes, and situations. The central hypothesis of Laub's study is the key, alternative 4, that young men fear crime less than do women and the elderly. Item 8 asks the examinee to make a judgment about the validity of certain conclusions based upon an accurate understanding of information presented and methods used to gather evidence. Alternative 4 is the key because it is a finding substantiated by evidence gathered in a national survey.

9. Content: Political Science/History
   Cognitive Level: Application
   Objective: Examines and identifies political systems
   Answer: 2

10. Content: Political Science/History
    Cognitive Level: Application
    Objective: Examines and identifies political systems
    Answer: 5

11. Content: Political Science/History
    Cognitive Level: Application
    Objective: Examines and identifies political systems
    Answer: 1

Items 9 to 11 represent a new item type designed to challenge examinees to apply or use information. A variety of ideas, events, issues, systems, organizations, etc. in the social studies can be explored through this new format. The format requires examinees to comprehend predefined categories and to classify new information within these categories. In the sample set provided, the examinee must first understand the definitions of the political systems presented, and then link the processes and events described to the corresponding systems. For example, item 9 describes the legislative process of the United States Congress and fits nicely into the prescribed definition of a representative democracy.

Science

At the recommendation of the Science Specifications Panel, the GED Science test will continue to have an equal balance of items from both the life sciences and the physical sciences. Items will not be developed to test factual knowledge directly but will require examinees to *use* information provided in the test items or acquired through life experience. Test items will illustrate that science education is acquired in both formal and non-formal settings. Abstract reasoning and problem solving ability are addressed as very important aspects in the science test.

Content

The content for the GED Science test is as follows:

A. Life Sciences: Biology 50%

B. Physical Sciences: 50%
- Earth Science
- Physics
- Chemistry

Test items relate to major conceptual themes—the "universal" concepts which cut across all disciplines of science. Major conceptual themes include: the constant state of change, conservation of mass and/or energy, interactions within or between natural systems, and the relationship of time and space to natural phenomena.

Context

The items in the new test measure the examinee's understanding of:

- how science relates to one's personal life
- the natural environment
- the potential and limitations of science in explaining natural phenomena
- the relationships between science educational skills and work activities.

Format

The Science test items are based upon written stimulus material or graphic stimulus material (e.g., graphs, tables, charts, diagrams, etc.). Written materials range in length from a question posed as the item stem to an article followed by a question pertaining to the information presented. Articles are written at a reading level that does not interfere with the assessment of the examinee's knowledge of science. Some items are grouped into sets for the sake of sharing common stimulus material (e.g., a set of items based on a written article or a set of items based on a graphic stimulus). Stimulus materials represent realistic situations encountered by large segments of the examinee population.

Cognitive Levels

The GED Science test no longer includes questions requiring only recall of facts. The Science test is designed to assess the examinee's higher level skills. Basic knowledge of scientific principles, concepts, and methods is *essential* not only to demonstrate an understanding of the information but to *use or manipulate* the information or ideas that are provided.

Science items are classified by cognitive level according to the same system as that used in the GED Social Studies test. The classification system is based on an adaptation of Bloom's taxonomy (*Taxonomy of Educational Objectives.* Benjamin S. Bloom, Ed. et al., 1958).

1. **COMPREHENSION** items require understanding the meaning and intent of written and graphic stimulus material. They measure the ability to:
   - restate information
   - summarize ideas
   - identify implications

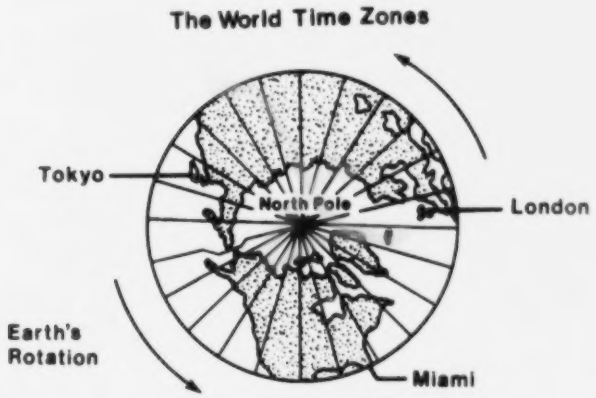
2. **APPLICATION** items require the ability to use information and ideas in a concrete situation. They measure the ability to:
   - use given or remembered ideas in a context other than that provided

3. **ANALYSIS** items require the ability to break down information and to explore relationships of component ideas. They measure the ability to:
   - distinguish facts from hypotheses or opinions
   - recognize unstated assumptions
   - distinguish a conclusion from supporting statements
   - identify cause and effect relationships

4. **EVALUATION** items require the ability to make judgments about the validity or accuracy of information or methods based on provided or assumed criteria. They measure the ability to:
   - assess the adequacy or appropriateness of data to substantiate hypotheses, conclusions, or generalizations
   - recognize the role values play in beliefs and decision making
   - assess the accuracy of facts as determined by documentation or proof
   - indicate logical fallacies in arguments

Sample Science Test Items

Item 1 is based on the following diagram.



1. The diagram above represents the time zones in the Northern Hemisphere. A telephone operator places a call from Miami at 8 a.m., June 1st, to London. The operator is asked what time it is in London. What is the operator's response?

   (1) 1 a.m.
   (2) 1 p.m.
   (3) 3 a.m., May 30th
   (4) 3 p.m., June 1st
   (5) 8 a.m.

2. Two factors influence a gas-filled container: one is the temperature of the gas and the other is the amount of pressure inside. If more gas is added or the temperature increases, the pressure inside increases.

   If a truck driver is traveling on a hot summer day, which of the following situations will be true if the driver begins the trip with properly inflated tires?

   (1) The tire pressure may drop in the heat.
   (2) The tires will expand even further.
   (3) The tires may go flat as the temperature drops.
   (4) Additional pressure may be required to maintain the temperature.
   (5) If the temperature increases the tire volume may decrease.

Items 3 and 4 refer to the following advertisement.

An advertisement for a popular salad oil states:

A. composed of 100% sunflower seed oil
B. the great salad oil you've always loved
C. absolutely no cholesterol
D. used in the finest restaurants

3. Which of the above statements is most likely based on facts rather than on opinion?

   (1) A only
   (2) B only
   (3) A and B only
   (4) A and C only
   (5) B and D only

4. Which of the above statements could *not* be proven in a chemical analysis of the salad oil?

   (1) A only
   (2) B only
   (3) A and B only
   (4) A and C only
   (5) B and D only

Items 5 to 10 are based on the following information. Organisms are classified according to the various ways they relate to each other. Below are five types of relationships.

(1) cannibalistic = an organism feeds on the flesh of its own kind

(2) mimicry = one organism resembles another in color, shape, or behavior

(3) mutualistic = different organisms live together, all benefiting from the relationship

(4) parasitic = one organism lives in or on another organism, causing harm to the other organism

(5) saprophytic = an organism feeds on the dead remains or the products of other organisms

Each of the following items describes a relationship that refers to one of the five categories defined above. For each item, choose the one category that best describes the relationship. Each of the categories above *may* be used more than once in the following set of items.

5. After a female cougar is killed, its mate returns to the den and devours the kittens.

   After the female died, the relationship of the male cougar to the kittens is

   (1) cannibalistic
   (2) mimicry
   (3) mutualistic
   (4) parasitic
   (5) saprophytic

6. The monarch butterfly is a common, orange-and-black butterfly often seen in fields around milkweed plants. The viceroy butterfly is slightly smaller than the monarch but it is also orange-and-black and looks like the monarch. Birds tend to leave both butterflies alone because the larger monarch does not taste good and it is difficult to tell both butterflies apart.

   The relationship of viceroy to monarch is

   (1) cannibalistic
   (2) mimicry
   (3) mutualistic
   (4) parasitic
   (5) saprophytic

7. Penicillium is a green mold that is commonly found growing on grape jam. The penicillium mold spreads and consumes the grape jam.

   The relationship of penicillium to jam is

   (1) cannibalistic
   (2) mimicry
   (3) mutualistic
   (4) parasitic
   (5) saprophytic

8. A lichen is thought of as a plant but it is actually composed of two organisms; a fungus grows together with an alga. The fungus supplies the alga with water and some protection while the alga supplies the fungus with carbohydrates for food.

   The relationship of the two organisms composing the lichen is

   (1) cannibalistic
   (2) mimicry
   (3) mutualistic
   (4) parasitic
   (5) saprophytic

9. The sea lamprey has a sucking mouth and a spine-covered tongue. It attaches itself to the side of a lake trout with its mouth and tears away at the lake trout's flesh using its tongue. After either killing the trout or seriously injuring it, the sea lamprey releases itself to seek another lake trout.

   The relationship of sea lamprey to lake trout is

   (1) cannibalistic
   (2) mimicry
   (3) mutualistic
   (4) parasitic
   (5) saprophytic

10. The oak daedalea is a fungus that is often found growing on oak tree stumps. The fungus obtains nutrients from the decaying tree stump.

    The relationship of oak daedalea to oak tree stump is

    (1) cannibalistic
    (2) mimicry
    (3) mutualistic
    (4) parasitic
    (5) saprophytic

Answer Key

1. Content: Earth Science
   Cognitive Level: Comprehension
   Answer: 2

   This item requires the examinee to understand the following points about the graphic presentation: due to the rotation of the earth, London passes through a time zone before Miami, so Miami time is earlier than London time; there are 24 time zones; each time zone is either one hour ahead or one hour behind the adjacent zones. London is 5 time zones ahead of Miami; thus, the answer is obtained by adding 5 hours to Miami time.

2. Content: Physics
   Cognitive Level: Application
   Answer: 2

   This item requires an understanding of the relationship between the temperature and the volume of a gas (Charles' Law), and the application of this understanding to the example of an inflated automobile tire that gradually increases in temperature.

3. Content: Chemistry
   Cognitive Level: Analysis
   Answer: 4

4. Content: Chemistry
   Cognitive Level: Evaluation
   Answer: 5

   These two items are examples of the difference between an analysis and an evaluation level item. The third item asks the examinee to distinguish facts from opinion. Statements A and C can be chemically proven while B and D are based on someone's view or judgment. The fourth item asks the examinee to make a judgment about the accuracy of the statements based on assumed criteria. Neither statements B nor D could be subjected to a chemical analysis.

5. Content: Biology
   Cognitive Level: Application
   Answer: 1

6. Content: Biology
   Cognitive Level: Application
   Answer: 2

7. Content: Biology
   Cognitive Level: Application
   Answer: 5

8. Content: Biology
   Cognitive Level: Application
   Answer: 3

9. Content: Biology
   Cognitive Level: Application
   Answer: 4

10. Content: Biology
    Cognitive Level: Application
    Answer: 5

Items 5 to 10 require the examinee not only to comprehend several predefined categories but to classify new information within the definitions of one of the categories. The categories used could come from topics such as the classification of matter, the classification of organisms, ecosystems, astronomical observations, or electromagnetic waves.

Item 5 describes the male cougar feeding on the flesh of its own babies, an example of cannibalism.

Item 6 describes the monarch and viceroy butterflies. Although they are different in size, their coloration is so identical that they are avoided by knowledgeable predators. The viceroy escapes predation due to mimicry.

Item 7 describes an organism (mold) feeding on the product (jam) of another organism (grape plant). This is a saprophytic relationship.

Item 8 describes an alga and a fungus existing together in a relationship called a lichen. As described, the relationship is an example of mutualism.

Item 9 describes one organism feeding on another living organism, an example of parasitism.

Item 10 describes a fungus feeding on the remains of another organism, an example of a saprophytic relationship.

Interpreting Literature and the Arts

By recommendation of the Language Arts Test specifications panel, what is currently the "GED Reading Test" will be called "Interpreting Literature and the Arts." The change in name was suggested for two reasons: 1) all the GED tests require reading skills, not just one, and 2) literature and the arts comprise a significant part of the high school curriculum.

Content

The revised test will no longer include sections on practical and general reading for the above reasons. These activities are also addressed more appropriately in other tests of the GED. Content areas for Interpreting Literature and the Arts now include

A. *Popular Literature:* 50%
B. *Classical Literature:* 25%
C. *Commentary about Literature and the Arts:* 25%

Popular Literature includes

1. Prose non-fiction
2. Fiction
3. Poetry and lyrics
4. Drama

Sources for this content area include writing of *acknowledged quality*, that is, good models of writing, yet not too difficult for the GED population. Using this principle, then, the works of Rod McKuen or Danielle Steele would not be considered appropriate, while those of the following authors would: Joyce Carol Oates, John Le Carre, Ken Kesey, Mary Gordon, and James Baldwin, to name a few.

Classical Literature includes literature from the same four genres as those included for popular literature and is drawn from literature of the nineteenth and twentieth centuries. While the line between popular and classical literature is fuzzy at best, a definition from Holman's *Handbook to Literature* (1972) provides a reasonable guide: Classical literature is that "which by common consent has achieved a recognized position in literary history for its *superior qualities* (also works by an author of similar standing)." Authors considered "classical" for our purposes include Steinbeck, Faulkner, Hemingway, Fitzgerald, Orwell, Thoreau, again, to name but a few.

Commentary includes writing *about*

1. Literature
2. Theater
3. Music/Dance
4. Film
5. Art

The panel's recommendations in this area underscore the principle that the educated person has some knowledge of the arts. Selections in this area are usually reviews, and must avoid both the examinee's need to have prior knowledge of the subject and the difficult vocabulary so common in this genre.

Context

The subject matter of Interpreting Literature and the Arts excerpts must take into account the very diverse GED population. Examinees come from many racial and ethnic backgrounds, as well as occupations, and none of these should be represented in literature that could be construed as stereotypical or demeaning. The selections should of course be "timeless" since the revised GED Tests will be taken into the 1990s. This consideration is particularly important for Commentary materials since the arts reviewed in this content area may frequently be "fads" (e.g., break dancing, New Wave music, graffiti art, etc.).

Format

The reading selections in Interpreting Literature and the Arts are coherent units with a beginning, middle, and end. Prose excerpts range from 200-400 words, while poetry excerpts range from 8 to 25 lines. Each selection is followed by 5-8 items which are classified according to cognitive levels.

Purpose Question: Another new feature of the Literature and the Arts test is the purpose question—a brief, easy-to-read question which appears before each excerpt. Its purpose is to provide a more natural setting for the examinee, that is, to create the "need to know" that occurs whenever an adult picks up reading material (a newspaper, an instructions manual, a best seller, etc.)

Cognitive Levels

1. **COMPREHENSION** items (60%) require an understanding of the meaning and intent of the writing.
   A. *Literal comprehension* items refer to ideas that are explicit in a specific part (literal/specific) or throughout the text (literal/global).
   B. *Inferential comprehension* items refer to ideas that are implied in a specific part (inferential/specific) or throughout the text (inferential/global).
2. **APPLICATION** items (15%) require the ability to use information and ideas from a text in a situation *different* from that described in the text.
3. **ANALYSIS** items (25%) require the ability to examine the elements of style and structure in an excerpt (e.g., tone, diction, organization, sentence structure, use of detail, metaphors, etc.) or to determine how these elements relate to the excerpt's effect.

Sample Excerpts and Items from Interpreting Literature and the Arts

Items 1-6 are based on the following article.

HOW DID THIS INVENTION CHANGE THE OLD WEST?

That a handcrank coffee mill helped kill off the Old West has not been widely appreciated. For five thousand miles I'd driven between fences, but along New Mexico 81, for the first time, there was none. At last I'd come to open range, a thing disappearing faster than the condor. In 1874, an Illinoisan, Joseph Glidden, received the first patent for a barbed fencing wire he made on a converted coffee mill. Ranchers called the stuff "the Devil's hatband," but they saw their economic future in it: the new fence gave means to control breeding and thereby upgrade stock, and it allowed a single well to water an entire herd. Before barbed wire, the West had few long fences because there wasn't wood enough to build them, and cattle trampled wooden fences anyway. No alternative to open range and cowhands existed. But a barbed wire fence was cheap to buy, erect, and maintain over the big acreages required in the West, and cattle shied from it once they ran against it. In the 1870's some animals cut themselves to death on it, and one rancher said that at first he could hardly drive a cow between two posts.

But Glidden's invention offered something even more important: a means of staking property claims, particularly on plats belonging nominally to the federal government. Ranchers fenced claims to establish ownership, and entire towns ended up encircled or cut off from access to public land. Neighbors tore out each other's fences, and President Cleveland ordered the Army to take down illegal ones. It was too late. What began as "range privilege" became an unlawful seizure that was the basis for many of the great cattle empires.

And so, from the prototype of the coffee mill, came the successors that partitioned the West and changed it forever: Glidden's Twisted Oval, Briggs' Obvious, Allis' Sawtooth, Scutt's Arrow Plate, Brinkerhoff's Riveted Splicer. Staples and pliers became more important than bullets and pistols, and the cowboy went from riding the range to riding fence and greasing the bearings on a windmill. No longer was there need to drive range cattle to pasturage and water or to sort out herds; the cowboy was on his way to becoming a feedlot attendant, and a piece of American history turned to legend. With the transport of cattle to market by truck, the shift was complete.

From *Blue Highways* by William Least Heat Moon. Copyright © 1982 by William Least Heat Moon. By permission of Little, Brown and Company in association with the Atlantic Monthly Press.

1. Who were the "successors" (line 16) who changed the West?

   (1) inventors
   (2) ranches
   (3) coffee mills
   (4) types of barbed wire
   (5) breeds of cattle

2. According to the excerpt, what is a major reason for the changes that occurred in the lifestyle of cowboys in the Old West?

   (1) Public land was made available for grazing.
   (2) Public land was fenced off so that it could no longer be used for grazing.
   (3) Ranchers were able to control the movements of cattle by fencing in the range.
   (4) The cowboys' job became much more difficult.
   (5) Cowboys could no longer be paid because of the expense of fencing in the range.

3. ". . . one rancher said that at first he could hardly drive a cow between two posts."

   The author includes this rancher's remark to show

   (1) that the fence posts were as effective as the barbed wire fences
   (2) how effectively the barbed wire fences restrained the cattle
   (3) how difficult the cattle were to train
   (4) how accustomed the cattle had become to the open ranch
   (5) the difficulties cowboys had in working with the new barbed wire fences.

4. The "range privilege" the author refers to in the excerpt (line 14) refers to the

   (1) opportunity to erect fences anywhere on the range
   (2) opportunity to seize land by claiming ownership
   (3) right to deny free access to public land
   (4) right to raise as many cattle as the range could support
   (5) right to use public land as grazing land for cattle

5. According to the excerpt, the effect the barbed wire fence had on cowboys was most similar to the effect the railroad had on

   (1) wagon train leaders
   (2) engineers
   (3) ranch owners
   (4) buffalo
   (5) gold prospectors

6. Why is the author's introductory sentence effective in capturing the reader's interest?

   (1) It provides an unexpected cause-effect relationship.
   (2) It explains some new effects of the changes to the Old West.
   (3) It relies on the author's personal experience in the West.
   (4) It refers to ideas about the Old West which are familiar to most readers.
   (5) It provides ample support for the position that is taken.

Items 7-13 are based on the following article.

HOW HAVE MACHINES AFFECTED TELEVISION SHOWS?

They never complain. They never forget their lines. They have no agents or egos. They are composed of moving parts, but their parts are rarely moving. They are sex objects who do not object to being handled, symbols of power whose judgments go unquestioned, the most impersonal of actors in the most personal of media. They are the new stars of prime-time network television: machines. Helicopters, cars and computers dominate such action-adventure shows as *Magnum, P.I., Matt Houston, Trauma Center, Scarecrow and Mrs. King, Cutter to Houston* and *The Fall Guy*. Coptermania is the current craze.

The air waves are bristling with blades, and gyrating, swooping chase sequences have become as common as the earthbound four-wheeled variety. ABC's new series *Blue Thunder* (derived from the movie of the same title) features a mean, blackbottle fly of a police chopper that is essentially an aerial machine gun equipped with supersnooping devices. CBS's *Airwolf* is about a supersonic CIA attack helicopter that is invisible to radar. One of its pilots, Ernest Borgnine, decorously refers to it as "she," as if it were a more temperamental version of the flying nun.

Traditionally, television heroes not only have right on their side, but they also brandish the fanciest gadgets. Bad guys drive the crummy cars. Faith in technology was the implicit theme of such shows as *Mission: Impossible* and *The Man from U.N.C.L.E.* On sophisticated medical series, from *Trapper John, M.D.* to *St. Elsewhere*, the wise doctors bolster their charming bedside manners with CAT scans. One exception to this pattern is NBC's current gaudy hit *The A-Team*, which crudely parodies the medium's infatuation with machinery. The team typically has to borrow (and often demolish) the newfangled hardware of its enemies because its own makeshift equipment is rusty and outmoded.

The team mascot, Mr. T, with his clanking jewelry, rocket-shaped hairdo and stiff acting, is actually the most fearsome machine on that show. On virtually all the rest of these series, the machines appear more animate than the actors. It is the human characters who seem mass-produced, interchangeable and equipped with only artificial intelligence. But therein may be the consolation. The more mechanically inhuman the shows become, the more they may take on another machine-like trait that in their case would be a blessing: built-in obsolescence.

From *Time*, (Vol 123, No.4, January 23, 1984) "Cars, Computers, and Coptermania" by Richard Stengel. Copyright © 1984 Time Inc. All rights reserved. Reprinted by permission from TIME.

7. As used in the article, what does the term "Coptermania" (line 6) mean?

   (1) fear of helicopters
   (2) excessive attention to helicopters
   (3) inability to control helicopters
   (4) hatred of helicopters
   (5) the misuses of helicopters

8. Which of the following statements best describes the author's opinion of the human characters in television action shows?

   (1) They are more interesting than the machines they use.
   (2) Each character has individual characteristics that are distinguishing.
   (3) They are more intelligent than the machines they use.
   (4) They are among the best of the actors on television.
   (5) The machines have human qualities and the humans are machine-like.

9. The author uses *The A-Team* as an example of an action show which

   (1) uses machines in a way typical of all other action shows
   (2) uses no machines at all
   (3) relies on actors' human characteristics rather than on machines
   (4) makes fun of the use of machines on other television shows
   (5) uses only the most technologically-advanced machines

10. Why does the author use the phrase "rocket-shaped hairdo" (line 19)?

    (1) to show the machine-like qualities of Mr. T
    (2) to compare Mr. T to a helicopter
    (3) to illustrate how television shows set fashion trends
    (4) to show why Mr. T is an ineffective actor
    (5) to contrast Mr. T's human qualities with those of machines

11. In the last sentence of the article (lines 22-23), the author reveals that he would prefer to see television action shows

    (1) that use fewer machines
    (2) last longer
    (3) go off the air quickly
    (4) use more modern machines
    (5) use actors with more machine-like characteristics

12. Which of the following types of television shows would the writer be LEAST likely to watch?

    (1) situation comedy
    (2) science fiction movie
    (3) rock concert
    (4) news program
    (5) serious drama

13. The writing style used in this article would probably NOT be effective in a review of a

    (1) presidential debate
    (2) television situation comedy
    (3) television crime drama
    (4) cartoon show
    (5) game show

Answer Key

Content: *Literary Selections/Popular*

1. Cognitive Level: Literal Comprehension/Specific
   Objective: To comprehend the meaning of a specific term
   Answer: 4

   This item is classified as Literal Comprehension because it calls for an *understanding* of a term in context, as distinguished from items which call for a *use of* or a *judgment about* some aspect of the text. It is useful to think of comprehension items as being either *specific* or *global* in their focus. Those that require an understanding of a specific word or line can be thought of as specific, while others, which rely upon an understanding of the entire excerpt, can be thought of as global.

2. Cognitive Level: Literal Comprehension/Global
   Objective: To comprehend the main idea of an excerpt
   Answer: 3

   This item, like the one above, relies upon a literal understanding of the information in the text, but the answer to the question is not provided in any one place within the text. Rather, the question is answered by means of a generalization that derives from the *entire* text.

3. Cognitive Level: Inferential Comprehension/Specific
   Objective: To interpret illustrative detail
   Answer: 2

   Because an answer to the question in the stem is not explicitly stated in the text, an inference is required; an examinee must *infer* (based upon the evidence in the context), the meaning of the rancher's illustration. In this case, the context upon which the inference is based is very specific—a single sentence—so this item represents an inference at a *specific* level. Inferential comprehension items may also draw their focus from the entire text, as in the following example.

4. Cognitive Level: Inferential Comprehension/Global
   Objective: To interpret the meaning of supporting concepts
   Answer: 5

   In this item, as in the sample above, the term in question is never explicitly defined in the text, so an inference is required to produce a definition. This item's focus is global in that the concept of range privilege is central to the entire purpose of the text, and the meaning of the phrase emerges from an understanding of the total text.

5. Cognitive Level: Application
   Objective: To understand and apply cause-effect relationships
   Answer: 1

   This item requires an examinee to use a concept described in the text in a *new* situation—i.e., the concept of occupations rendered obsolete by technology is applied to the railroad's eliminating the role of the wagon leader. The item is more difficult than a comprehension item, of course, because it first requires that an examinee understand the concept indicated in the excerpt before applying it to a different context.

6. Cognitive Level: Analysis
   Objective: To evaluate the effect of stylistic techniques
   Answer: 1

   This item focuses attention on the writer's techniques and calls for an *analysis* of how or why the technique is effective. Items at the analysis level are generally concerned with the *craft* that went into constructing the text.

Content: *Commentary/Television*

7. Cognitive Level: Literal/Specific
   Objective: To comprehend the meaning of specific terms
   Answer: 2

   This item asks the examinee to determine the meaning of a word from the clues provided in the preceding sentences. Again, this kind of item merely asks for a literal interpretation rather than the ability to draw inferences or transfer information to a new situation.

8. Cognitive Level: Literal/Specific
   Objective: To comprehend supporting statements
   Answer: 5

   The information for this answer is stated specifically in the last paragraph. While literal comprehension items are never "look up" questions, they still ask only that the examinee understand what is actually given in the excerpt.

9. Cognitive Level: Literal/Global
   Objective: To comprehend the meaning of illustrations
   Answer: 4

   Items 8 and 9 also illustrate the difference between literal specific and literal global items, but the distinction is not as clear as that between items 1 and 2. The "line" here is crossed when the "A-Team" is discussed in more than one paragraph, but the information is still given explicitly in the text.

10. Cognitive Level: Inferential/Specific
    Objective: To comprehend the meaning of figurative language
    Answer: 1

    Examinees are not expected to know literary terms by name, but they should understand their concepts. Thus, it is not necessary to know that "rocket-shaped hairdo" is a "metaphor," but it is essential to know that this phrase is making a comparison.

11. Cognitive Level: Inferential/Specific
    Objective: To comprehend the meaning of a conclusion
    Answer: 3

    This item not only asks for an understanding of words like "obsolescences" and "trait" in context, but asks that the examinee *infer* the author's intent from what he actually says.

12. Cognitive Level: Application
    Objective: To recognize the author's point of view and apply it to a new context
    Answer: 2

    Again, this kind of item is more challenging than comprehension items because an idea must be abstracted from the entire text. In this case, the examinee must deduce what the writer doesn't like about these television shows and apply that information to a new situation.

13. Cognitive Level: Analysis
    Objective: To understand the tone used in the excerpt and predict its effectiveness in a new context
    Answer: 1

    This item type asks for an understanding of the concept of "tone," if not its definition. That is, the examinee should be able to perceive that a certain diction, choice of topic, and examples all give this excerpt an irony and informality without the need to understand any of these terms.

Mathematics

At the recommendation of the Mathematics Panel of the GED Specifications Committee, the major areas to be tested in the GED Mathematics test will continue to be arithmetic, algebra, and geometry. The Mathematics Panel, recommended the following specific guidelines for the GED Mathematics test:

(1) the mathematics test should be primarily a measure of the applications of mathematical theory;
(2) analytical and reasoning skills should be measured;
(3) examinees should be expected to read and decipher mathematical context from a written form;
(4) problems should be presented in a practical, everyday context;
(5) test items should address more than one math concept;
(6) formulas should be provided for those questions requiring them;
(7) non-programmable calculators should be permitted for use by the examinees (this recommendation is currently being studied by GEDTS staff);
(8) the new test should address computer literacy.

Content

First among the changes in the revised tests is a re-definition of the content areas. What is currently called arithmetic has been divided into three separate areas: number relationships, measurement, and data analysis. These areas will comprise 50% of the test. Algebra and geometry will comprise 30% and 20% respectively. The content areas are summarized in the following table.

Content Area	% of Test
Arithmetic	
Measurement	30
Number Relationships	10
Data Analysis	10
Algebra	30
Geometry	20

The specific skills to be tested within each content area are listed below.

ARITHMETIC

Measurement
- perimeter
- area
- volume
- rate of motion
- rate of interest
- time, money

Number Relationships
- sequencing fractions and decimals
- ordering and comparing data
- exponents, scientific notation

Data Analysis
- calculating mean, median, ratio, and simple probability
- interpreting graphs and tables

ALGEBRA
- translating context into symbolic language
- setting up equations
- solving equations
- inequalities
- quadratic, linear functions
- factoring
- algebraic fractions

GEOMETRY
- parallel and perpendicular lines
- triangle theory
- slope, midpoint, distance problems
- Pythagorean theorem
- congruent, similar, isosceles, and right triangles

Context

The contexts of the mathematics questions, insofar as possible, are realistic (rather than academic) tasks with which the adult student has had considerable experience. The situations are natural, rather than contrived, and deal with the world of work, the consumer, the computer, family experiences and situations, and so forth.

Format

All mathematics items are multiple choice questions based on either a brief written stimulus or a graphic stimulus (e.g., graphs, tables, charts, diagrams). Two thirds of the questions have written stimuli; one third have graphic stimuli. Single items consist of up to about 50 words or a graphic stimulus. Item sets consist of up to about 100 words or a graphic stimulus accompanied by 2-4 questions.

Also included in the revised mathematics test is a page of formulas. Up until now, formulas have been provided in the context of each question as required. Under the new format, examinees will be required to (1) identify which concept is being tested, and (2) select the appropriate formula from the formula page. This appropriately fits the examinees' experiences—the need to use reference materials when faced with a problem in a real setting.

Cognitive Levels

The cognitive levels of the items in the GED Mathematics test have been expanded to include higher level thinking skills and problem solving ability. The number of items requiring single-step solutions will be reduced, and more multiple-step questions will be included. Algebra questions will continue to be presented in realistic contexts, but students will need to be able to do simple, as well as moderate to difficult word problems; to translate contexts into algebraic language, and represent a sequence of operations in arithmetic and algebraic language.

As illustrated in the sample items that follow, examinees will need to be able to differentiate between sufficient and insufficient data, relevant and extraneous data, and determine the necessary sequence of steps to solve a problem.

FORMULAS

Description	Formula
AREA of a:	
square	$a = b^2$; where a = area, b = base
rectangle	$a = bh$; where a = area, b = base, h = height
triangle	$a = (bh)/2$; where a = area, b = base, h = height
circle	$a = \pi r^2$; where a = area, $\pi \cong 3.14$, r = radius
PERIMETER of a:	
square	$p = 4b$; where p = perimeter, b = base
rectangle	$p = 2b + 2h$; where p = perimeter, b = base, and h = height
triangle	$p = a + b + c$; where p = perimeter, a, b, and c are the sides of the triangle
circumference of a circle	$c = \pi d$; where c = circumference, $\pi \cong 3.14$, d = diameter
VOLUME of a:	
cube	$v = b^3$; where v = volume, b = side of the cube
rectangular container	$v = bhw$; where v = volume, b = base, h = height, and w = width
cylinder	$v = \pi r^2 h$; where v = volume, $\pi \cong 3.14$, r = radius, and h = height
Pythagorean relationship	$c^2 = a^2 + b^2$; where c = hypotenuse, a and b are the legs of the right triangle
distance between two points in the plane	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$; where (x_1, y_1) and (x_2, y_2) represent two points in the plane
slope of a line	$s = \frac{y_2 - y_1}{x_2 - x_1}$; where (x_1, y_1) and (x_2, y_2) represent two points in the plane
mean	$\text{mean} = \frac{x_1 + x_2 + \cdots + x_n}{n}$; where the x's are the values for which a mean is desired, and n = number of values in the series
median	median = the point in an ordered set of numbers at which half of the numbers are above and half of the numbers are below this value
simple interest	$i = prt$; where i = interest, p = principal, r = rate, t = time
distance as function of rate and time	$d = rt$; where d = distance, r = rate, t = time
total cost	$c = nr$; where c = total cost, n = number of units, and r = cost per unit

Sample Mathematics Test Items

Items 1 to 4 refer to the following information.

After several interviews, Pat was offered two jobs and had to decide which to take. The starting salary for Job A is $15,500 per year, with a 4% raise to be given after six months, and a 6% raise to be given after one year. She will have to drive 10 miles each way to this job, which will use about 20 gallons of gas per month in her car, and she will have to pay $50 per month for parking. The monthly salary for Job B is $1350 with a 10% raise to be given after one year. There are no parking facilities at Job B, so Pat will have to use a combination of bus and subway transportation. Each way, the bus fare is $.50, and then the subway fare is $1.50. Pat's decision on which job to take is based only on which job will net her more money, since both jobs appear equally interesting to her.

1. At Job A, what will Pat's salary be after one year, to the nearest dollar?

   (1) $16,120
   (2) $16,430
   (3) $17,050
   (4) $17,087
   (5) Insufficient data is given to solve the problem.

2. Including gas and parking, how much will it cost Pat for transportation each month if she takes Job A?

   (1) $71.80
   (2) $72.40
   (3) $74.60
   (4) $77.00
   (5) Insufficient data is given to solve the problem.

3. At Job B, what will Pat's annual salary be after one year?

   (1) $1,485
   (2) $16,200
   (3) $17,050
   (4) $17,820
   (5) Insufficient data is given to solve the problem.

4. Including bus and subway fare, approximately how much will it cost Pat for transportation each month if she takes Job B?

   (1) $80.00
   (2) $70.00
   (3) $40.00
   (4) $20.00
   (5) Insufficient data is given to solve the problem.

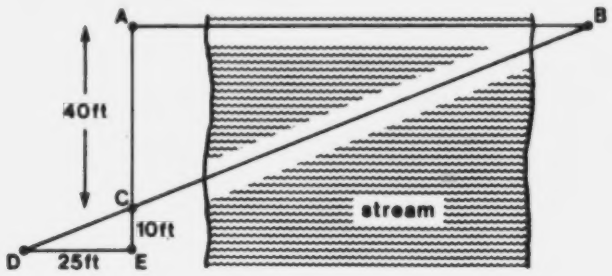
5. In loading cartons, a shipper places parcels with the greatest weight on the bottom and parcels with the least weight on top. Five parcels are to be placed in a carton. The parcels have the following weights:

   parcel A – 3 *ounces*
   parcel B – 0.5 *ounces*
   parcel C – 200 *ounces*
   parcel D – 10 *pounds*
   parcel E – 5.5 *pounds*

   Which of the following sequences correctly lists the order in which the parcels should be placed in the carton?

   (1) C, D, B, E, A
   (2) D, C, E, A, B
   (3) C, D, E, A, B
   (4) E, B, C, D, A
   (5) E, C, D, A, B

Item 6 refers to the following figure.



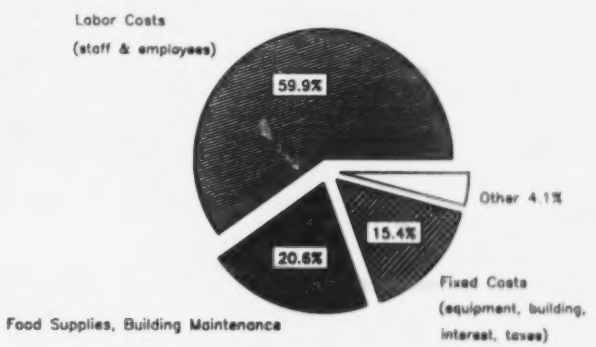
6. A surveyor made the measurements shown in the above diagram. What is the straight line distance (in feet) from A to B across the stream?

(1) 50
(2) 75
(3) 80
(4) 100
(5) 150

7. In a charity marathon race, the ratio of men to women was 24:5. If there were 144 men in the race, how many *people* participated?

(1) 29
(2) 30
(3) 149
(4) 173
(5) 174

8. If the total budget for a nursing home is 2 million dollars per year, and there are 100 staff members and employees, what is the average yearly income of each staff member or employee, as based upon the graph below?



(1) $ 10,000
(2) $ 12,000
(3) $ 20,000
(4) $120,000
(5) Insufficient data is given to solve the problem.

9. An annual report of a dry cleaning business contains 180 pages. The average number of words on a page is 350. The speed of the computer printer used to print the report is 70 words per minute. Which of the following expressions gives the approximate number of *hours* it will take to print the report?

(1) (180 x 350)/(70 x 60)
(2) (180 x 350)/70
(3) (180 x 350 x 60)/70
(4) (180 x 350 x 70)/60
(5) (180 x 350 x 60)/70

10. Each of the expressions below can be simplified EXCEPT

(1) $X - 1$
(2) $X^2 - 1$
(3) $X^2 - X$
(4) $X^4 - 1$
(5) $X^4 - X^2$

Answer Key

1. Content: Measurement
Answer: 4

This problem requires the examinee to select pertinent information from the passage, namely $15,500 as the starting salary, and the percents, 4% and 6%, which represent Pat's two raises. It is then necessary to perform the sequential operations below.

(1) $15,500 × (.04) = $620, *amount* of raise
(2) $15,500 + $620 = $16,120.

The $16,120 represents Pat's salary after her first raise. The solution continues, as follows, to determine her salary after the *second* raise.

(3) $16,120 × (.06) = $967.20, *amount* of raise
(4) $16,120 + $967.20 = $17,087.20
(5) Rounding off the answer, we get $17,087

2. Content: Measurement
Answer: 5

To answer this question, it would usually be necessary to know (1) how far Pat must drive to work for Job A; (2) how many miles to the gallon her car obtains; and (3) how much she spends per gallon of gasoline. In this case, the first two questions are answered by the fact that she would need to use about 20 gallons of gas each month for Job A. However, we are *not* told the cost of gasoline per gallon. So, insufficient data is given to answer the question.

3. Content: Measurement
Answer: 4

To find Pat's salary after one year requires 3 steps. First, it is necessary to determine 10% of $1,350 to get the monthly increase:

0.1(1,350) = 135.

Second it is necessary to add the monthly increase to the original monthly salary:

1,350 + 135 = 1,485

Third, it is necessary to multiply by 12:

$1,485 × 12 = $17,820, which is her *annual* salary after one year.

4. Content: Measurement
Answer: 1

To determine Pat's transportation costs for Job B, the examinee must perform the following operations:

(1) .50 + 1.50 = $2.00, which is the cost one way

(2) 2.00 × 2 = $4.00, which is the round trip cost for one day

(3) 4.00 × 20 = $80.00, which is her approximate cost for a month.

5. Content: Number Relationships
Answer: 3

To correctly solve the problem, the examinee would have to convert the weight of the parcels measured in pounds to ounces, and to rank order them from heaviest to lightest, since that is how they are to be placed in the carton. This is an example of a number relationships problem for which sufficient information has been given.

6. Content: Geometry
Answer:4

The problem requires that the examinee recognize that the triangles in the diagram are similar and that the lengths of the corresponding sides can be set into a proportion.

$$\frac{10}{25} = \frac{40}{X}$$

$$10X = 25(40)$$
$$10X = 1000$$
$$X = 100.$$

This item would be classified as a solution problem for which sufficient information has been given.

7. Content: Algebra
Answer: 5

This problem requires the examinee to set up the equation and to solve for X.

$$24X = 144$$
$$X = 6$$

It is then necessary to return to the opening sentence and evaluate or substitute to find the number of women. Hence we do the following:

$$5(X) = 5(6) = 30 = \text{number of women}$$

One then adds 30 + 144 = 174 = number of people. This is an algebra item requiring a solution, for which sufficient information has been given. It is one of the more difficult types of test items.

8. Content: Data Analysis
Answer: 2

The examinee would need to recognize that the budget allows 59.9% or 60% for salaries (labor costs). After multiplying $2 million by 60%, that is, 2,000,000 X (.6), the examinee would divide the preceding result by 100.

$$\frac{2{,}000{,}000 \text{ X } (.6)}{100}$$

(It would be easier to divide 2,000,000 first by 100 and then multiply by (.6)). This is a moderately difficult, multiple-step, data anlaysis item for which sufficient information has been given. The item is graphic because the diagram has been given.

9. Content: Measurement
Answer: 1

This measurement problem requires the organization of the given data into a complex fraction. It is necessary to multiply the number of pages by the number of words on each page, and to divide by the speed of the computer. This yields the number of words processed per minute. We divide again by 60 to get the *word yield per hour*.

Note: $\dfrac{\dfrac{180 \times 350}{70}}{60}$ In condensing the above, we get answer (1)

10. Content: Algebra
Answer: 1

The first expression alone cannot be simplified. Each of the others can be simplified and is factorable. This is a relatively easy item which requires some basic knowledge of algebra and, specifically, of factoring. This is an example of a symbolic algebra item. Some symbolic items will be included on the examination. Their inclusion is a more practical way of testing particular concepts, (i.e., number line theory, inequalities, numerical evaluation, equations). The use of this type of item will be strictly limited.

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